HOW CAME CIVILIZATION?

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HOW CAME CIVILIZATION?

by

LORD RAGLAN

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PREFACE

WHILE writing an earlier book, I was one day engaged in copying some passages from Dr. A. B. Cook's *Zeus*. In came my seven-year-old son:

'What are you doing?'

'Copying some bits out of this book.'

'What for?'

'To put in my book.'

'Well, you *are* lazy. Why don't you think of it for yourself?'

The view thus simply expressed is astonishingly common, namely, that a writer should draw his materials from his inner consciousness, and that by so doing, that is, merely by taking thought, he can add to the sum of human knowledge. Of course no chemist or biologist holds this view of his own branch of science; he knows that advances in knowledge can only be made through research and experiment, and that these, though directed by the brain, are carried on with materials derived from outside it. Yet even eminent scientists too often consider that successful research in one subject entitles them to put forward, as contributions to our knowledge of other subjects, opinions entirely unsupported by research.

The origin of civilization is a subject on which almost every one considers himself qualified to express an opinion, whether he has made any study of it or not. It is usual to picture as a single entity what is in fact an assembly of diverse elements; until we have studied some of these elements in isolation, we have no right to pronounce upon the origin of civilization as a whole.

For the purposes of this study history and literature, that

is to say, European history and philosophical literature, are almost useless. We must have recourse to comparative ethnology, archaeology, and whatever has remained to us of the writings of the earliest available civilizations, such as those of Babylonia, Egypt, and Syria. I lay stress on *comparative* ethnology, since generalizations based on the study of a single tribe are as worthless as those based on a study of some part of modern Europe.

In this book I have attempted little more than to indicate the lines upon which inquiry into the origin of civilization must proceed. We must first, as I have already said, divide it up into its elements. Then, taking each element by itself, whether it be an artefact such as the plough or the wheel, or a custom such as that of mummification, we must plot its distribution at the earliest period for which we have evidence. We must also study its context, that is to say, the other elements with which it is found in association. Such research *may* enable us to say where and how it came into existence; no other procedure can give us any useful result.

Research is, of course, much more laborious than speculating about the inventive powers of the human mind, but its results are increasingly to convince researchers that the inventive powers of the human mind have usually been exaggerated, and that although most discoveries and inventions might in theory have been made many times over, the evidence suggests that few if any, even of the simplest, have in fact been made more than once. In the latter half of the book I have given some of this evidence.

I should like to thank those who have helped me with literature and other information, and in particular Professor G. Lindblom, of Stockholm, and Professor C. Daryll Forde. The latter read the typescript and suggested many amendments, most, though by no means all, of which I accepted.

Mr. Emrys G. Bowen was kind enough to draw the maps, and my wife the figures. Both maps and figures are intended merely as examples of the study of types and distributions, such as is essential to the advancement of our knowledge of human origins.

RAGLAN

CONTENTS

ILLUSTRATIONS

DIAGRAM

MAPS

HOW CAME CIVILIZATION?

Chapter I

CULTURE, CIVILIZATION, AND PROGRESS

THE purpose of this book is to challenge certain widely held beliefs concerning culture, civilization, and progress, and since we cannot avoid using these frequently ill-used words we must start by attempting to define them. Let us start with culture. A common use of the word is to describe that which distinguishes the educated among us from the uneducated; in this book, however, it will be used in its more strictly scientific sense of patterned behaviour, that is to say, behaviour which is actuated not by innate impulses but by that which the individual learns, either by instruction or imitation, from other members of his social group. It consists, in fact, of all forms of human behaviour, except those which are also found among the apes. The only exceptions are the recent products of original genius, which since they have yet to become patterned, can hardly be considered as expressions of culture. They are, as we shall see later, extremely rare.

There is one element of culture which distinguishes all men from all animals, and that is the use of language. Language is the expression of definite ideas by means of the larynx, lips, and tongue. Apes and other animals can express certain emotions by means of sounds, but attempts to show that these sounds mean something more definite have failed.

There are many human traits which have analogies among the lower mammals, and among birds and insects. These include the making of buildings and of various articles for use and ornament, and the elaborate forms of social behaviour found among ants. Apes and monkeys, however, have no artefacts which can properly be described as such;

they do not grow crops, domesticate other animals, cook, wear clothes nor draw pictures; these activities, therefore, when practised by human beings, must be classed as cultural, as must all forms of social organization not found among apes and monkeys.

There are many forms of behaviour which man has in common with the apes. Among them are the impulses towards mating and parenthood; the desire for company; the tendencies to imitate, to show off, to attack when angry and run away when frightened; the impulses to play, to hunt, and to explore. That all these forms of behaviour are instinctive in animals there can be no doubt, but how far they are natural in man and how far the result of training is open to doubt. The desire in man for the company of his fellows, for example, may be the consequence not of a 'gregarious instinct', such as is often postulated, but of habituation to communal life. Such questions are, however, beside the immediate point; animals have by definition no culture, and since their behaviour has never led them to culture, there can be no reason for believing that the activities which man shares with them could have led him to culture.

There is no element of culture which is essential to human existence; men can live on food gathered in a wild state and eaten raw; a diet of fruit, eggs, and shellfish requires neither pots nor knives. Many savages have still neither clothes nor houses, and people when attacked still defend themselves with sticks, stones, fists, and fingernails. As for social organization, the loose grouping in extended families, which obtains among such peoples as the Pygmies and Sakai, seems to be little different from, and in no way superior to, that which obtains among the apes.

Since, then, the primary needs of mankind can be satisfied without culture, it is clear that culture could not have arisen as a response to human needs. Man's more complex needs are not the cause but the result of culture. We often speak

of savages as *doing without* clothes, forks, beds, and other things which we regard as necessities, but this is a misuse of terms. They *are without* these things, whereas we have learnt to *do with* them. The most civilized people are those who regard as necessities the largest number of luxuries. Nobody can regard as a necessity anything, apart from mere animal requirements, which he has not possessed himself or seen in the possession of his neighbours. It is as absurd to suppose that early man invented pottery because he felt its need as it would be to suppose that modern man invented the telephone because he felt its need.

The telephone, like many other luxuries, has become a necessity, an integral part of civilization. And what is civilization? It may be defined as literate culture. The gulf that divides a literate from an illiterate society is a wide one. Its width is seldom realized, since between literate and illiterate *individuals* there need be no gulf at all. Many illiterates are people of high intelligence, and the ploughman or bricklayer who can read just enough to gather the football results from a newspaper may be in no way superior to one who cannot read at all. But a civilized society, in so far as it is civilized, does not consist of ploughmen and bricklayers, any more than it consists of foxhunters or politicians. All these occupations may exist in illiterate, that is uncivilized, societies. The persons who follow these occupations may be civilized, but that is another matter. A society is civilized only if it contains scholars and scientists. The scholar consolidates and clarifies the knowledge which has already been acquired, and hands it on to the scientist, who, thus provided, proceeds to experiment, and thus to the increase of knowledge. Without the torch of learning, the scientist is reduced to groping in the dark, and without the scientist to use and test the results of his learning, the scholar sinks into a barren pedantry. Thus scholarship and science, in the widest sense of these terms, are the warp and

woof of civilization. And the scientist, no less than the scholar, is dependent upon the written word; not only must he be able to use the learning of the scholars, but he must be able to record the results of his own investigations.

Since, then, civilization depends upon scholarship and science, and these depend upon writing, civilization can only arise where the art of writing is known. Now there are two kinds of writing, the pictorial and the alphabetic. The latter is known to be comparatively modern. Every alphabet in the world is derived from the alphabet which was developed, about the middle of the second millennium B.C., in the Eastern Mediterranean, probably in Phoenicia. This fact, which is undisputed, suggests two conclusions. The first is that since the chief medium of civilization, the alphabet, was diffused from one centre, civilization itself was diffused from one centre. The second is that since the later kind of writing, the alphabet, which is now almost universal, was diffused from one centre, the earlier kind of writing, which never had more than a very limited distribution, was probably diffused from one centre. This earlier kind of writing differs from the alphabetic in that each sign represents not a sound but an idea. Writing of this kind, except for some survivals such as our numerals, is now confined to Eastern Asia, and at its widest extent was limited to an area stretching from North Africa through Southern and Eastern Asia to Polynesia and Middle America. It was never used in Europe, the inhabitants of which continent were totally ignorant of writing until the alphabet was introduced from the East. Up to 1000 B.C. Europe beyond the Aegean was totally illiterate and therefore totally uncivilized; the Middle East had then been literate and civilized for thousands of years.

That the art of writing should come before civilization need cause no surprise, since it is, as inventions go, an extremely simple one. In its crudest form, it consists merely

in using conventionalized drawings as a means of communication. On the usual theories of savage inventiveness, it should be within the competence of any savage, yet the early inhabitants of Europe and Africa, though they made drawings, never conventionalized them into any kind of writing, and their successors, far from developing the art of writing, lost that of drawing.

The one certain lesson that history teaches us is that no human society can remain for long in a static condition; every society must either progress or retrogress. And what is progress? Progress consists in the increase of knowledge, whereas retrogression consists in the loss of knowledge. In every human society, knowledge is continually being lost. This loss is brought about in two ways: by the death of persons who have failed to pass on all their knowledge, and by the destruction or decay of records. A progressive society is one in which the amount of knowledge which is being gained exceeds that which is being lost. Such societies are rare. Among savages there are no scholars to maintain knowledge, still less scientists to replace what is lost, so that all savage societies are, as we shall see later, on the downward grade. The most expert potters or weavers are destroyed by a war or a pestilence, and their knowledge is lost to the tribe for ever.

In civilized, that is literate, societies, the amount of knowledge is far greater and more varied, and owing to the existence of scholars, who are continually re-writing and bringing up to date the records of the past, knowledge that is of any value or interest is much less easily lost. It usually happens, however, that the scholars concentrate on certain branches of knowledge, to the neglect of others, and that these latter decay, and gradually bring about the decline of the whole civilization. In theory progress is not essential to civilization; a society which maintained unimpaired its knowledge of medicine, agriculture, metallurgy, and so on, might

maintain its whole culture at the same level *ad infinitum*. In practice this never happens, since sooner or later there will be wars, plagues, famines, fires, and floods which will blot out the repositories of knowledge, whether these be records or persons. The fact that it requires a perpetual struggle to maintain civilization, let alone to advance it, is little realized, since for the last three or four hundred years Western Europe, with its colonies in America and elsewhere, has been going through a phase in which the gains in knowledge have far more than compensated for its losses. Recently, however, there has been a change, and there are now those who tell us that war may bring about the downfall of civilization. According to the generally accepted theories of progress this is impossible. It cannot be supposed that a war, however disastrous, would destroy all, or nearly all, of the inhabitants of Western Europe, and the survivors should be able to join up the broken threads, and continue as before. Perhaps those who make this dismal prophecy have a dim realization of the fact that civilization does not depend just upon people, but upon scholars and scientists, and that their existence depends upon a good deal more than the mere necessities of life. Exactly what their existence does depend on it is extremely difficult to say, but one certain fact is that, taking the world as a whole, the unimpaired maintenance of knowledge is a rare phenomenon, and any increase of knowledge very much rarer still.

Chapter II

PROBLEMS OF DIFFUSION

IT is not many years since the existence of problems of diffusion was first recognized. Up to the end of the last century resemblances in culture were accepted as belonging to one of two classes, those of which the history was known, and those of which the history was unknown. If the history was known, as, for example, the history of Christianity or Islam is known, then, of course, the resemblances were put down to the fact that these religions had been diffused, each from some one centre. However remote the spot where Christians or Moslems were found, nobody, not even the wildest theorist, ventured to suggest that these religions had arisen independently there. If, however, the early history of any widespread feature, the belief in witchcraft, for example, was unknown, it was assumed as a matter of course that it could not have been diffused from one centre, but must have originated independently wherever it was found, in response to some stimulus acting upon a tendency supposed to be innate in the human mind.

It was the same with material inventions. It was known that the Africans had acquired their guns from foreigners, and the fact that these guns supplied a felt want was therefore not regarded as showing that local demand had led to local supply. But the Africans also had bows and arrows. These also supplied a felt want, and judging by the history of guns it might have been thought at least possible that local demand had been met by foreign supply. It was, however, not so thought. The history of bows and arrows was unknown, and it was therefore assumed, as a matter of course, that they had been independently invented by

every African tribe which possessed them. It was, in fact, regarded as axiomatic that if you do not know where anything came from, you are entitled to assume that it originated wherever you happen to find it.

Professor R. B. Dixon (*The Building of Cultures*, p. 223) attempted to give scientific backing to this very unscientific view:

> 'That diffusion', he says, 'is responsible for a large number of apparently disconnected similar traits is probable, but there remains a considerable residuum for which independent origin is the only rational explanation. For common sense and the laws of probability must be applied to all cases, and when an explanation by diffusion requires us to assume that the extremely improbable or almost impossible has occurred, the *onus probandi* becomes very heavy. Where the physical difficulties in the way are very serious, we must refuse to be carried away by vague generalities and demand very concrete proof, and *until such proof is forthcoming the alternative of independent invention or convergence must be preferred*' (my italics). 'That diffusion has been responsible for cultural development to a far greater extent than independent invention is quite certain, but occasional independent invention cannot, in the face of the evidence, be denied.'

In spite of the admission in the last sentence, what Professor Dixon would have us believe is that if in any part of the world we find people using a particular implement, we are bound to assume that they invented that implement unless it is otherwise proved. To do this he has to resort to a good deal of special pleading. In the first place what is 'extremely improbable' is not, as he suggests, a matter of fact, but merely a speculation, quite valueless as a proof. Then he tells us that if we do not know which of

two alternative hypotheses is true, one of the two becomes 'the only rational explanation' and is to be accepted without any proof at all; the other would require 'very concrete proof'. In any doubtful case diffusion must be rejected, although it has affected culture 'to a far greater extent' than independent invention.

Professor Dixon also urges us to apply 'common sense and the laws of probability', but there are no relevant laws of probability, and common sense is quite inapplicable. Common sense is the result of experience gained in our daily life, and can no more help us to decide questions of human origins than it can entitle us to express an opinion on the theory of relativity. The common-sense view is, and must remain, that the sun goes round the earth. We reject that view because we have, in that particular case, passed from the realm of common sense into that of scientific induction.

Professor Linton (*The Study of Man*, p. 371) gives a good example of the fallacious conclusions to which common sense may lead us in questions of diffusion. There is a particular type of silver brooch which is found in only two parts of the world, that is to say, among certain Indian tribes living in the neighbourhood of Lake Superior, and one tribe in the interior of the Philippine Islands. Common sense tells us that direct contact between these two areas is impossible, and indirect contact almost impossible, and by the standards accepted by many theorists we should be entitled, or even compelled, to hold that this is a case of independent invention. Research shows, however, that these brooches were made in France in the sixteenth century for trade with the Highlands of Scotland. Some of them were carried with other trade goods to Canada, and others were sold to Spanish merchants trading in the Philippines. Such an example shows us the worthlessness of arguments for independent invention based on the supposed impossibility of diffusion.

Professor Goldenweiser (*Anthropology*, p. 323 n.) who is equally with Dixon opposed to the theory of diffusion, adopts a different argument. He explains that totemism could not be accounted for by a single historical accident followed by diffusion because 'the very conditions favouring the borrowing of totemism from without would invite its development from within'. In other words, nobody ever borrowed anything, since if people had whatever it was they would not need to borrow it, and if they did not have it they would not want it. It is hardly necessary to substitute 'Christianity', 'firearms', or even 'silver brooches' for 'totemism' to show the fallacy of this argument.

We should, however, be grateful to such writers as Dixon and Goldenweiser, who attempt to make a case for their opinions, since the usual practice of believers in multiple invention is to regard their theories as self-evident facts, and to treat with contempt those who question them. Thus, Dr. Westermarck says that 'it is truly grotesque to assume' that 'such widespread or universal culture elements as, for instance, the right of property, punishment, the blood-feud, the various forms of marriage' and so on, are due to borrowing (*J.R.A.I.*, 1936, p. 231).

Dr. Westermarck, and those who agree with him, base their theories on the doctrine of the similar working of the human mind. The essence of this doctrine is that every human being is born with tendencies which lead him to make stone axes, bows and arrows, and dug-out canoes; to organize himself into totemic clans; and to believe in witchcraft, animism, and survival after death. These are assumed to be the mental and material equipment with which nature endowed primitive man, and which he proceeded to improve upon wherever local conditions allowed his innate progressiveness to develop.

It has, of course, been recognized for the last seventy years that man is descended from an ape-like animal, and it has

never been suggested that ape-like animals have any of the ideas or artefacts mentioned above, but no attempt has been made to explain why the transition from animal to human status was accompanied by such remarkable changes in innate mental endowment. And if such traits were innate, how is it that they are not universal? Dr. Westermarck recognizes that they are not, since he speaks of 'the various forms of marriage'. It is true that all human communities have some form of marriage regulation, but they vary so much that it is impossible to believe any one of them innate, and the same applies to the rights of property. As for punishment, the very idea of it is foreign to savages, and the senseless and pernicious custom of the blood-feud is by no means universal. Many communities have been taught to dispense with this latter custom, and if they can be taught to dispense with it, they could be taught to adopt it. Behaviour which is universal may be natural, though, as in the case of speech, there is no certainty that it is; what is not universal can only be acquired by teaching, and anything that a person can learn from his own group he can learn from outside it.

Westermarck and his school make no attempt to explain why the human mind has not worked in the same way upon phenomena which must be more primitive than punishment or the blood-feud. Let us take the phenomenon of twins, which must have been familiar to man before he emerged from an ape-like state, and upon which his mind should have worked similarly if it worked similarly upon anything. In some savage communities twins are regarded as extremely lucky, and they are credited with supernatural powers; in others they are regarded as extremely unlucky, and are killed at birth. It is the same with food taboos; some tribes live principally on fish, milk, or eggs, whereas other tribes refuse to touch them. There is a vast number of tools and weapons, customs and taboos which though widespread are

by no means universal. Their incidence cannot, as will be seen later, be accounted for by environment, and no unprejudiced person can attribute them to the similar working of the human mind, since such similarity is meaningless if it is not universal. The argument for its existence is merely circular: how do we know that the human mind always works similarly? Because we find similar inventions and customs all over the world; why do we find similar inventions and customs all over the world? Because the human mind always works similarly.

Such a travesty of logic could never have found acceptance were it not that it supplies a felt want, the want of many scientists and nearly all scholars for a theory which will help them to put a ring-fence round the subject of their studies. If classical scholars had to admit that Greek culture, far from being the product of the special genius of the Greek race, imposed upon the general genius of the human race, was really the fruit of a tree whose roots extended as far afield as Egypt, Mesopotamia, Persia, and even India, they would have either to widen the range of their studies or abandon their pretence to a localized omniscience. And if Americanists had to admit the possibility, which becomes more and more a probability, that the civilization of Middle America came from Asia, then they would be reduced to the status of experts in a group of provincial cultures.

One of the greatest dangers to our civilization is that nearly all knowledge is in the minds of professionals, of people who are paid to teach or act upon a certain set of supposed facts, and who take as an insult or a threat any suggestion that these supposed facts are inaccurate or incomplete. To all of these (and to all nationalists) the theory of diffusion is anathema, since it lets the deep sea into scores of little ponds, upon which little experts sail fleets of toy boats. These toy boats cannot survive in the sea of diffusion, which requires a well-found vessel carrying a large crew.

Yet the hypothesis of diffusion merely assumes that prehistoric times were not very different from historic times. Among the chief features of recorded history are conquests, migrations, and colonizations which completely transformed the cultures of vast areas. In modern times we have the European colonization of America, Australia, and South Africa. Earlier we have the Roman conquest of Western Europe and the Arab conquest of North Africa. All these movements have, so far as the great majority of the inhabitants are concerned, submerged the previous cultures. Even where the earlier inhabitants have not been absorbed, as in South Africa, they are rapidly adopting the culture of their conquerors. North Africa has been the home of great civilizations, Egyptian, Carthaginian, Greek, and Roman, yet there is little in its present culture which antedates the Arab conquest. We see Buddhism spreading from India to China and Japan; Islam from Arabia to Nigeria, Central Asia, and Java; not to speak of the spread of Christianity. Similarly we see such inventions as gunpowder, printing, steam power, and electricity spreading all over the world and displacing older devices.

The hypothesis of multiple invention assumes that though such movements have been going on ever since the beginnings of recorded history, nothing of the sort ever happened where there was no recorded history. It encourages us to suppose that diffusion to Britain began with Julius Caesar; to America with Columbus, and to Central Africa with Livingstone.

The hypothesis of diffusion, on the contrary, is that history merely records some of the more recent incidents in a process which has been going on for untold millennia, probably since the time, some half-million years ago, when man first appeared. Diffusion depends, of course, on transport and communication, and these have recently been speeded up, but it is often forgotten that all the great movements of peoples and cultures which took place before 1840

depended on the use of sails and of wheeled vehicles, means of transport which have been in use for at least five thousand years, or two thousand years before the beginning of European history. That culture movements covering vast areas did in fact take place in prehistoric times is clear from the researches of archaeologists, who are largely engaged in tracing types of pots, bronze axes, and other artefacts across the length of continents. It is no exaggeration to say that every excavation of any importance affords evidence of previously unsuspected cultural relationships between more or less remote areas. Except where there was some form of script our knowledge of these relationships is confined to material objects, but observation of what is happening to-day shows that there is never any considerable transmission of material culture without a corresponding transmission of ideas and beliefs. It is possible, of course, to transmit objects of iron or glass by mere barter without any exchange of ideas at all, but impossible to acquire the arts of iron-working or glass-blowing without a good deal of social intercourse. No serious student believes that these arts were invented more than once, and the same applies, as we shall see later, to many other arts. It is absurd to suppose that people travelled about Europe, Asia, and Africa teaching people by signs to work iron, and then returned to their homeland leaving no other trace of their presence, yet this is another of the absurdities implicit in the case for independent invention. It is obviously possible, one would think, that the people who transmitted the art of iron-working might at the same time transmit stories or superstitions connected therewith, yet there are writers galore who will assure us that such stories and superstitions, however similar, are never transmitted, but are the product of the local 'folk' wherever they are found.

We shall later discuss the 'folk' as inventors; what we must here note is that the fact of independent invention has never

been established. That is to say, that no invention, discovery, custom, belief, or even story is known for certain to have originated in two separate cultures. The invention which is always put forward, for want of a better, by believers in multiple invention, is the fire-piston, a means of obtaining fire by moving a stick bound with tow rapidly up and down in a tube. This device has a wide distribution in South-eastern Asia, and must, one would think, have often been seen by European sailors and traders in those parts. Yet we are asked to believe that no European had ever seen or heard of it before it was 'invented' by a Frenchman at the beginning of the nineteenth century. (H. Balfour, in *Essays to Tylor*, p. 17.)

Even, however, if this was really a case of independent invention, it would prove little, since discoveries such as this, which might be the result of a single random act, are not sufficient to show that the human mind works everywhere alike, or that highly complex inventions, or elaborate systems of social organization, could be arrived at independently. A very simple artefact might have been invented many times, if little adaptation was required, and its use could be foreseen; or even if its use could not be foreseen and it was the kind of thing that chance might put into the hand of a savage. Early man, breaking sticks to make a fire or a shelter, would soon break one to a sharp point, and might well use this point to stick into the ground, when it would be come a digging stick. Using a flint to crack oyster-shells, he might well break off a flake and cut his finger. If he were exceptionally intelligent, its use as a knife might well suggest itself.

At the other end of the scale, an Englishman and a Frenchman, working on the same problem, with the same literature before them, might well arrive simultaneously at the next step. Professor Ogburn (*Social Change*, p. 90 ff.) gives a list of inventions and discoveries made independently

by two or more persons. With one or two exceptions in favour of the Ancient Greeks, all are modern, and all are within the limits of Western civilization. The solution of the problem of respiration was discovered independently by five scientists in four European countries in 1777. The discovery of the cellular basis of animal and vegetable tissue is said to have been made independently by seven scientists in 1839. Three scientists are said to have independently invented the centrifugal pump in 1850. But all this, it must be repeated, has nothing to do with the naturally similar working of the human mind. Knowledge of the previous steps had been diffused, and it was this fact alone that made the next step a possibility, whether it was taken by one person or several persons.

We shall see later that basic inventions, those upon which civilization has been founded, require a very large number of steps, which must be taken in the right order. There is not the slightest evidence that this process has taken place independently in two or more distinct cultural regions; in fact, as we shall see, all the evidence is against it.

The problems of diffusion, then, are not concerned with whether it has taken place. It has taken place from the earliest times, and is at the present moment going on all round us. The real problems are how anything comes to be invented at all, and how, having been invented at some one place, it finds its way about the world.

Chapter III

THE INFLUENCE OF ENVIRONMENT

THOSE who believe that man is naturally inventive and progressive, and that the human mind always tends to work in the same way, often ignore the fact that culture varies greatly in different parts of the world. Those of them who recognize this fact usually attempt to explain it in terms of geography. Their theory is, or seems to be, that the presence of absence of such traits as human sacrifice, horned demons, faience beads, sailing-ships, and stringed musical instruments can be explained in terms of physical environment.

This theory has been stated in its simplest and most fallacious form by Professor Arnold Toynbee, who scouts the idea that any form of culture has ever been diffused, and assures us that 'the Minoan civilization was a response to the challenge of the sea, the Egyptiac [*sic*] civilization a response to the challenge of the Nile', and so on (*A Study of History*, vol. i, p. 438). No such view is held, or can be held, by any one who has studied the distribution of any culture feature, and many anthropologists have warned their readers against them. Let us quote some of these warnings:

> 'Geographical influences are doubtless far from negligible,' says Durkheim (quoted by L. Febvre, *A Geographical Introduction to History*, p. 45), 'but it does not appear that they have the kind of preponderance which is attributed to them. There is not one of the features of social life for which they can, so far as we know, account. . . . Geographical conditions vary from place to place—

and we find identical social types in the most different parts of the world.'

'That the geography of an area plays a part cannot be denied,' says Professor Herskovits (in *Africa*, vol. iii, p. 65), 'but we are forced again and again, on close analysis, to the position of according its importance mainly in its aspect of a factor which limits the play of culture in the area.'

'There are, of course, limits,' says Professor Febvre (op. cit., p. 356), 'and one would not think of growing pineapples in Greenland, but within each of the great climatico-botanical zones there is room for a hundred cultures which, so far as land and climate are concerned, are equally possible.'

'It is essential', says Sayce (*Primitive Arts and Crafts*, p. 29), 'to avoid the temptation of trying to explain any culture entirely in terms of the immediate environment. Every culture has grown out of an earlier one which itself may have been the result of adaptation to a different environment or by a people in a different stage of development.'

'The origin of culture centres', says Wissler (*The American Indian*, p. 372), 'seems due to ethnic factors more than geographical ones. The location of these centres is largely a matter of historic accident.'

Both Professor Febvre and Professor Dixon criticize at length the theory of environmental determinism which was (later) put forward by Professor Toynbee. The former observes (op. cit., p. 144) that:

'Corsica is an island of indented coasts, at the gate of Italy and Provençal France, but never has any seafaring

population been known there. Its few ports have been founded by strangers, Tuscans or Genoese. The Corsican remains a mountaineer, shepherd, or husbandman; he turns his back on the sea with the same indifference as the Albanians, who have never had any communication by sea along their own coasts or across the Adriatic. "A striking contrast to the Greeks," we are told, but what Greeks? Those of Laconia, for example, never had the reputation of being great seamen.'

'A well-indented coast-line,' says Dixon (*The Building of Cultures*, p. 16), 'with many harbours and inlets, tends, it is said, to develop seafaring life, and numerous striking instances of people with maritime cultures living on such coasts are pointed out. But many equally striking exceptions exist, as, for example, in Tasmania, where with such a coast-line the people were virtually destitute of such a craft. Again, islands are said often to develop as centres of maritime culture, with far-reaching trade and commerce. The instances of Crete, the British Isles, and Japan are cited in confirmation of this. It is true that Crete *was* a striking example of such development; it is not so to-day. The other two cases must also be accepted with reserve, for England did not become a maritime country till Elizabethan times, and Japan's development as a maritime and commercial state is really only a matter of the last fifty years. . . . The Canary Islands are another notable example of the absence of seafaring abilities, for here the Guanches are reported by most of the early authorities as wholly destitute of any means of navigation.'

To come down from the general to the particular, let us quote Professor Goldenweiser (op. cit., p. 447) on the Eskimo:

'What is more plausible, one might ask, than that the

Eskimo should build snow houses? Is not this material abundantly provided by nature, and does it not lend itself admirably for structural purposes? For once, then, the environmentalists seem to stand on sure ground—until a glance across the Bering Strait reveals the cultural status of the Chukchee and Koryak. These two Arctic peoples live under physical conditions differing in no essential respect from those of the Eskimo. Here, as in Arctic America, snow is almost continuously available; but there is no evidence of snow houses. Instead we know that these people construct large, clumsy tents, made of hide over heavy wooden supports, and that they have persisted in this custom in the face of their seasonal migrations, during which they drag these clumsy contraptions along with them.'

I have given the above quotations in the hope of showing that the environmental theory of civilization, though it may linger among scholars, has been completely abandoned by scientists. Good harbours make a maritime civilization possible, but there is no reason to believe that they produce or even stimulate such a civilization. The harbour of Hong Kong is one of the finest in the world, and the Chinese have for thousands of years been great navigators; yet they made no use of it. The great river valleys of America, especially the Mississippi and La Plata, play a very great part in the civilization of America to-day; in that of pre-Columbian America they played almost no part at all. Is environment responsible for the glory of Palmyra, or its desolation? One could ask a thousand such questions, and the answers would all be against Professor Toynbee.

But though all scientists are against the environmental theory in the extreme form in which Professor Toynbee states it, yet some of them still hold exaggerated views of the influence of environment on culture. Even Sir Arthur

Evans, whose researches in Crete have convinced him that the Minoan civilization was largely derived from Egypt (*vide* his Huxley Memorial Lecture, *J.R.A.I.*, 1925), regards it as 'an undoubted fact' that among primitive races 'similar needs and materials are apt to produce objects of similar appearance' (*Antiquity*, 1935, p. 216). It would be difficult to find another statement which begged so many questions in so few words.

In the first place we have no reason to believe that needs lead to objects at all, if by objects is meant artefacts. As I have tried to show (p. 3), all artefacts were originally luxuries.

In the second place, it is untrue, except to a very limited extent, that similar materials are apt to produce objects of similar appearance. The craftsman, confronted with a new material, always tries to produce in it artefacts with which he is already familiar. All over the world we find people going out of their way to make artefacts of one material in imitation of those which they had previously made in another. Such imitations are called 'skeuomorphs'. We find pottery vessels made to imitate horn, gourd, leather, and wood; wooden cups imitating horn; bronze weapons imitating stone and vice versa; stone pillars imitating tree-trunks; and, in our own culture, ferro-concrete structures imitating stone. (For some good examples, see Sayce, *Primitive Arts and Crafts*, p. 82.) It has always been the tendency of both savage and civilized man not to adapt his forms to his materials, but to force new materials into familiar forms.

Even, however, when we have acquired a need, and learnt to use a particular material to meet it, it by no means follows that we produce objects of similar appearance. Scythes and mowing-machines are steel implements made to meet our need to mow grass or corn; they are, of course, very different in appearance. It may be objected that the mowing-machine is not 'primitive', whatever that term may be supposed to

mean. Let us then take a simpler artefact, an offensive weapon made of wood. According to Sir Arthur Evans's theory, any one confronted with the need for a weapon, and wood to make it with, should produce a specimen of one universal pattern. Of course, we find nothing of the kind, but instead a vast assortment of wooden swords and spears, clubs, darts, and boomerangs. Not only are there many types of weapon, but the weapons of each type vary to such an extent that the expert can tell at a glance where a particular weapon comes from. 'If we consider the whole form of a club,' says Dr. Harrison (*Pres. Ad., Sec. H., Brit. Ass.*, 1930, p. 18), 'it is rarely indeed that there is any doubt as to provenance. There has been independent evolution, but it has led to divergence and not to similarity.' We must distinguish between evolution and invention. The differences to which Dr. Harrison refers do not involve the discovery of any new principle.

As another example of the very limited extent to which similar needs and materials produce objects of similar appearance, let us take the stone wall. I have heard it alleged that a stone wall is bound to be pretty much the same everywhere, but this is far from being the case.

A stone wall may be straight or curved in plan; it may be dry or made with different kinds of mortar; the stones may be large or small; rough-faced, squared or polygonal; they may be set perpendicularly, horizontally, or obliquely, and may or may not be regularly bonded. The wall may be thick or thin, solid, hollow, or filled with rubble; it may be of stone alone, or of stone interspersed with bricks, tiles, or timber; the upper courses may or may not be different from the lower; there may or may not be string-courses or buttresses; corbels or machicolations at the top, and an apron or plinth at the bottom. The wall may be left plain, or plastered, or whitewashed.

Some of these features add to the stability of the building,

and may be supposed to be the result of experience, but many of them are quite arbitrary, and must be the result of following a tradition which had other objects than stability in view. Some seem to be intended as imitations of other materials. The foundation walls of the temple of Apollo at Delphi, for example, which are composed of large pieces of faced but irregularly shaped stone set like a jig-saw, seem intended to imitate the native rock. Round buttresses and pilasters are probably intended to imitate tree-trunks, as are the columns of Egyptian and Greek temples. A building with a plastered outside may be intended to represent a mound of earth. We can form no certain conclusion in such matters by studying the actual buildings, but only by historical and archaeological comparisons. It would seem from these to have been the ancient rule that stone should be used only for the dwellings of the gods and the dead. The living, even the living kings, dwell in houses of wood. This rule seems to have obtained in Egypt, Greece, Japan, and pre-Columbian America, and to have been recognized by the Normans, who built Hereford Cathedral of stone while they built the bishop's palace alongside it of wood. Such customs, and their name is legion, depend little upon materials and not at all upon needs. Brick or mud may replace stone for the dwelling of the dead, while the living may dwell in tents or huts made of branches, but the distinction is usually preserved. And this distinction is not utilitarian. There is no need to make dwellings for the dead, and the Australian blacks, for example, make no dwellings for the living.

Let us take one more example. In Northern Europe people eat and cook with butter and animal fats, and drink beer, while those of the south eat and cook with olive oil and drink wine. Those who believe in the influence of environment might suppose that the Northern Europeans had evolved butter and beer and the Southern Europeans

olive oil and wine to meet the conditions of their respective environments. But if they supposed this they would be quite wrong, since neither barley, nor the olive, nor the vine is of European origin, and it is more than probable that the art of milking was introduced into Europe from Asia. As Professor Febvre says (op. cit., p. 161):

> 'It was only gradually that, in the Mediterranean area, olive oil was substituted for butter and wine for beer, and that a new area of material civilization was formed, which increased and expanded up to the limits which climate allowed. The men of the North, unable to cultivate the olive and vine under their cold skies, kept to the foods which they originally had in common with the men of the South.'

In this case, as in many others, we see that a phenomenon which seems at first sight to be due to environment proves on investigation to be merely an example of diffusion limited by climate. Environment may make it easy to develop culture along certain lines, and difficult or even impossible to develop it along others, but the belief that it necessarily stimulates inventiveness is part of the general fallacy that man is naturally inventive, and merely requires some stimulus to bring his inventive faculties into play. The fact is that man, far from being naturally progressive, is normally retrogressive, as we shall see in the next chapter.

Chapter IV

RETROGRESSION

THE fact that in many parts of the world there exist remains of civilizations which have long since passed away is one which cannot fail to be recognized. We have the records and remains of Egypt and Babylon, of Greece and Rome; the jungles of the East and of Central America contain the half-hidden ruins of many a temple adorned with magnificent carvings; in places as far apart as Stonehenge, Zimbabwe, and Easter Island are great stone erections evidently linked with cultures which have long been lost.

But to recognize these facts is one thing, to explain them another; why do civilizations decay and disappear? One theory, which once had a considerable vogue, is that all the remains I have mentioned are evidences of the former existence of a Golden Age, or at all events of an age when men in general were better and cleverer than they are now, and that the history of mankind, far from being one of progressive rise, is one of progressive degradation. One still finds people who believe that the Ancient Egyptians, or the Ancient Hindus, knew a great deal more about everything than we do, but since such people are not now to be met with in scientific circles, we may perhaps safely disregard them.

A much more widely held, and at the first glance much more plausible, theory is that nations, like individuals, have their day. When that is done, and when they have made every contribution to progress that they are capable of making, then the mysterious force which controls the universe sweeps them away to make room for younger and more vigorous races which will begin again where the old

ones left off, thus ensuring the progress, not indeed of every individual or every group, but of the human race as a whole.

When, however, we examine this theory, we find that it will not fit the facts. The builders of Babylon and Borobudur, of Uxmal and Zimbabwe, and of many another great city of the past, were succeeded not by people who could revive and carry forward their civilization, but by the savage, the jungle, or the desert.

Nor is it clear in what sense a nation can be said to grow old, in fact the analogy drawn between the nation and the individual appears to be completely fallacious. The old men of a 'young' nation are just as old as those of an 'old' nation, and the children are no younger.

The theory is, it would seem, a corollary of the Nordic fallacy. The Roman civilization was destroyed by the Goths, Vandals, Franks, and Saxons, and all these tribes were, or are supposed to have been, Nordics. It is alleged that all that was best in the Roman civilization came from the Nordic element among the Romans; that this element was gradually swamped by non-Nordic elements from the south and east, which gradually brought about its decay. Then down came the Nordics who cleaned up the mess, and made a fresh start by combining with their own culture whatever of good remained to the Romans.

There are no facts to support this view. So far as we know, the northern races, whether Nordics or not, had no part in the foundations of civilization, which were laid in the Nile-Indus region long before any speakers of Aryan languages—and the Nordics of Europe are all Aryan speakers—entered this region. It was formerly believed that the civilization of India was due to Aryan speakers, but it is now known that the civilization of the Indus Valley had reached a very high state long before their arrival.

As regards Western Europe, it is no exaggeration to say that the Germanic tribes reduced it from civilization to

savagery. Philosophy, history, mathematics, astronomy, and medicine on the one hand; roads, drains, and baths on the other, disappeared and had later to be reintroduced from the East.

The Nordic barbarians had, previously to their invasion of the Roman Empire, acquired via the Black Sea certain elements of Greek culture, but they knew little if anything that was unknown to the Romans. Much of the culture of Rome, which included that of Greece, was lost to Western Europe for centuries, and would have been lost altogether had it not been preserved by the Byzantines and Arabs. It is hardly an exaggeration to say that Western Europe was re-civilized from Arab Spain. There is nothing in the history of Europe, or of any other part of the world, to support the view that an occasional barbarian invasion supplies civilization with a necessary tonic, a view which would involve our keeping enough barbarians in being to sack London and Paris every few centuries, whenever it might be considered that we had reached the appropriate degree of senility.

The facts of retrogression, apart from the Nordic fallacy, are tolerably well known in so far as they apply to the civilizations of the Mediterranean and the Near East. It is also generally realized that the colossal ruins found in India, Indo-China, and Java bear witness to the disappearance of ancient civilizations in those areas. What is not realized, however, is that apart from the great culture complex which we call Western civilization, every culture in the world is to-day in a state of stagnation or decay.

The Arabs, Persians, Indians, and Chinese were once leaders of civilization. They produced writers, artists, and craftsmen whose productions influenced the whole world. But that was long ago; such influence as they have had in the last five hundred years is not due to anything which they have produced in that period, but merely to the fact that Europeans visiting their countries have brought back items

of culture which though new to Europe were old in their countries of origin. This phenomenon is not due to European conquest or exploitation, since it makes its appearance before European influence made itself felt in the East. Arab culture was dying before the Turks took Cairo or the Spaniards Granada. Persia has produced nothing since the days of Hafiz and Omar Khayyám. The ephemeral and exotic splendour of the Mogul empire, fed with the decaying remains of Persian and Arab culture, threw the real India, the India of the Hindus, into the shade, and thereby obscured the fact that it had not had a new idea for a thousand years. The fall of the Ming dynasty marks the end of creative culture in China. We find the same phenomenon in America; the civilization of Peru reached its culmination about A.D. 800, that of the Mayas about A.D. 1000 (C. Wissler, in *The American Aborigines*, p. 175). Both had long been in a decadent state when the Spaniards arrived.

In spite of these facts, which can hardly fail to be admitted, there are many eminent persons who maintain that the human race, as a whole, is advancing steadily along the path of wisdom and knowledge. Sir James Frazer, for example, assures us that all the races of men have made and are still making progress towards a better social condition, the only difference being that savages advance more slowly than the civilized (*The Gorgon's Head*, p. 345). How this view is reconciled with the facts which I have mentioned above is not clear, but the idea seems to be that excessive luxury or other causes from time to time lead civilized man to overreach himself and bring about his own downfall, while the savage plods steadily onward. This idea is supported by the term 'backward races', which is almost universally applied to savages; it implies that they are now in the stage that we were in a few thousand years ago, and, if left alone, would in time rise to something similar to the stage in which we are now.

Not a single fact can be adduced to support this theory. All the available evidence suggests that no savage society, when left to itself, has ever made the slightest progress. The only change that takes place in isolated societies is change for the worse. Neighbouring groups with different culture elements may to some extent cross-fertilize each other, but they can never fertilize themselves. Much has been written about the demoralization which savages have suffered as a result of contact with Europeans, but the other side of the picture is usually neglected. Contact with Europeans or other outsiders may lead to a variety of results, from rapid rise to complete extermination; the absence of such contact invariably leads to a slow but steady decline.

This decline is often difficult to trace, since savages have no history and their artefacts are for the most part perishable. Our conclusions must be drawn chiefly from the study of non-perishable artefacts, such as stonework and pottery, and from a comparison of the present condition of savages with that described by early travellers.

Tylor remarks that

> 'degeneration probably operates even more actively in the lower than in the higher culture', it 'no doubt has lowered or destroyed many a savage people. . . . There is reason to look upon the miserable Digger Indians of North America and the Bushmen of South Africa as the persecuted remnants of tribes who have seen happier days. . . . It would be a valuable contribution to the study of civilization to have the action of decline and fall investigated on a wider and more exact basis of evidence than has yet been attempted' (*Primitive Culture*, vol. ii, pp. 46–8).

Such an investigation has never been attempted, perhaps because it would be destructive of the theory of progress cited above. In the next few pages I shall attempt a contribution towards it.

Evidence is most readily available in islands, since as a rule they are more isolated culturally than continental regions, and is particularly plentiful in Polynesia. Many writers have gone into ecstasies over the beauty and charm of the Polynesian Islands and their inhabitants, and have lamented the degeneration which the latter have undergone as a result of their contact with Europeans. While this degeneration is very regrettable, it is nevertheless certain that the culture of these peoples was in a state of decay before Europeans appeared on the scene. The limits of Polynesia, that is to say, Hawaii, New Zealand, and Easter Island, form a triangle with sides not far short of four thousand miles in length, and separated in some cases by hundreds of miles of open sea, yet all the Polynesians bear so close a resemblance to one another in language and customs that it cannot be many centuries since their ancestors were in close touch with one another, and it is probable that they spread to their present homes from some common centre.

Many of the Polynesians still possess sea-going canoes, but for as long as they have been known to Europeans they have not ventured far out of sight of land, and have never attempted long voyages, such as that from Tonga to Hawaii, which must have been achieved again and again by their ancestors.

In many of the islands there are erections built of large blocks of stone. In some islands these are still used for worship and burial, but in many their origin and purpose have been completely forgotten. The modern Polynesians are completely ignorant of the art of building in stone.

On Easter Island, the most eastward island of the Polynesians, and consequently the farthest from their centre of dispersion, are numbers of gigantic stone statues. These were presumably made by the ancestors of the present inhabitants, yet the latter cannot now carve stone at all. They

have also lost culture in other ways. In 1774, when the island was visited by Captain Cook, the inhabitants had canoes, which they used for fishing, though these are described as 'very leaky'. They now have no canoes at all, and fish by swimming (*Ethnos*, 1937, p. 106). It does not appear that their loss of the art of canoe-building is attributable to Europeans.

Another fact, a very striking one, is that on Easter Island are found inscriptions on wooden plaques in a form of picture-writing, which shows a resemblance to some ancient types of Asiatic picture-writing. The present inhabitants neither make nor understand these inscriptions, but their existence suggests that not only the Easter Islanders, but all the Polynesians, were once familiar with picture-writing, though none of them have now any knowledge of it.

The reputation of the Maoris of New Zealand, the southernmost of the Polynesians, stands high, but it seems clear that their culture was declining before the arrival of the Europeans. It is long since they lost the art of carving in jade, an art in which their ancestors were very proficient. Dixon (*Building of Cultures*, p. 280) says that 'the Polynesians in their eastward drift into the Pacific lost textiles, pottery, and metal-working, and gave up the use of the bow'. The loss of pottery may in some cases be due to the lack of suitable clay, but the rest are examples of what always happens to people who lose contact with the centres of civilization.

Rivers (Westermarck's *Festkrift*, pp. 112–13) discusses the distribution of pottery in Melanesia, and tells us that it was once much more extensive than it is now.

> 'Fragments of pottery are found scattered about in Malikolo and Pentecost, in neither of which pottery is now used. . . . In Leper's Island (Omba) Glaumont has found coarse potsherds lying nine feet below the surface, and in Ambrym pottery has been found accompanying an ancient

burial. Similar discoveries of pottery have been made in New Guinea. Here pots are still made in the districts where this ancient pottery has been found, but in south-eastern New Guinea the ancient pottery is far superior to that now made, though similar to it in several respects. . . . Thus there is clear evidence that pottery has disappeared from some islands where it was once in regular use, and that in others where pottery is still used, the art has fallen far below its former level of excellence.'

Other forms of culture have been lost in Melanesia. The Malekulans have lost the art of carving in stone (J. Layard in *J.R.A.I.*, 1928, p. 203), and though the Papuans know how to weave fabrics with the hand-loom, yet this art is dying out, even where European influence has not affected them. In the New Hebrides the art of weaving seems to have been flourishing at the beginning of the seventeenth century, but has long since disappeared (*Man*, 1928, p. 46).

Carved stones and other artefacts unearthed on the Watut River, in New Guinea, indicate that this region was formerly inhabited by people of a culture far superior to that of its present inhabitants (*Man*, 1938, p. 69).

Thurnwald (*Economics in Primitive Communities*, p. 127) observes that 'the fact of the handicraft being limited to single families often resulted in its loss when the family died out, as we know to have happened with boat-building in the Torres Islands, weaving in Ureparapara, and pottery-making in Santo'.

Pottery-making has died out in many parts of the New Hebrides, and this may be due to the irksomeness of the taboos with which its manufacture is surrounded (T. Harrisson, *Savage Civilization*, p. 353 n.).

We find a similar phenomenon in America. 'The Navaho claim to have discontinued making baskets because the work was surrounded with a great number of ceremonial taboos

and restrictions' (quoted in *Am. Anth.*, 1934, p. 114). Thus we find savages abandoning useful arts owing to the loss of, or impatience with, their magical accompaniments. These facts take us far from the savage of theory, I might say the savage of fiction, who keeps on steadily improving his handicrafts to keep pace with his developing needs.

Let us now pass to Australia. Forty years ago it was confidently asserted that the Australian blacks had never been in contact with any higher culture, and that they represented 'primitive man' in every possible sense of that term. This view can no longer be maintained. It is now recognized that the blacks of the Northern Territory have been influenced by Malays from across the Timor Sea, and that those of Northern Queensland have been in contact with the Melanesians of New Guinea. The culture of the latter is higher than that of the Australian blacks, and, as we have just seen, shows clear signs of having once been higher still.

The remarkable physical type of the Australian blacks has suggested to Hooton (*The American Aborigines*, p. 159) that it may combine a negroid element with an archaic white type represented strongly in the Ainu of Japan. Such diverse racial elements might be expected to involve cultural elements equally diverse. Anyhow, the culture of the Australian blacks contains many elements not found in that of the Bushmen, Pygmies, Negritoes of Malaya, and others with an equal claim to the title of 'primitive man'. They possess varied and highly complex marriage regulations which seems to accord very ill with the simplicity of their economic life, and are probably due to the retention in a more or less degraded form of elements derived from people of higher culture.

The now extinct Tasmanians were racially distinct from the Australian blacks, so must either have preceded the

latter in Australia or reached Tasmania by long sea-voyages. In the latter case they would have to have had sea-going vessels, and a much more elaborate culture than they had when first visited by Europeans. In the former case they must have been survivors of people exterminated or absorbed by the Australian blacks, who would thus be not primitives but later invaders. To reach Tasmania from even the nearest point of the mainland would require more efficient vessels than the Tasmanians are known to have had, and their long residence in a highly fertile and salubrious island had certainly done nothing to raise them in the scale of culture, even if in other respects we cannot be certain that they had deteriorated.

Another people often described as 'primitive' are the Veddas of Ceylon. The Veddas are hunters and food-gatherers of the forest, and know nothing of cultivation. Their whole culture is of an extremely low type, but they speak an Aryan language. Savage Aryan-speakers in the Caucasus or the Carpathians might conceivably be primitive; in Ceylon they can only be degenerate.

I shall discuss the origins of African culture in a later chapter, but it may be as well to indicate at this point some of the reasons for believing that, like all savage cultures, it is in a state of decay. Let us start with the Bushmen, who are believed to be the descendants of the earliest human inhabitants of Africa. Their culture is of a very low order, yet they make rock-paintings with considerable skill, and bury their dead in recessed graves with their faces to the east. Similar paintings are found near the Mediterranean, and this mode of burial was known in Ancient Egypt. The Bushmen are related to the Hottentots, but the latter dispose of their dead in a more summary fashion, and know nothing of rock-painting, though in other respects their culture is higher than that of the Bushmen. The probability is that both races were once in contact with higher civilizations,

but have since deteriorated (*v.* G. M. Theal, *Ethnography and Condition of South Africa before A.D. 1550*, pp. 63, 105). We learn from Hambly (*Source Book of African Ethnography*, p. 332) that 'in time past the Cape Bushmen, also some Hottentots, made pottery, but this is now a lost art'. It does not appear that the art has been lost owing to foreign influence, since the Bushmen now use ostrich egg-shells in place of pots.

The ruins of Zimbabwe in Rhodesia have become famous, and many people believe that they were built by King Solomon, or the Queen of Sheba. This belief has no possible foundation in fact. It is now known that Zimbabwe was built between the ninth and thirteenth centuries of our era, about two thousand years after the supposed date of King Solomon, and there is every reason to believe that the builders were native Africans. Miss Caton-Thompson, whose careful investigations finally put these facts beyond doubt, concludes that 'the time-scale in Rhodesia leads away from the best towards deterioration', and she quotes Selous as saying that 'in Makoni's country, at any rate, there is clear evidence that there has been a gradual deterioration from a people who were capable of building walls which will compare with any part of the Great Zimbabwe to the very inferior hut-building barbarians of the present day' (*The Zimbabwe Culture*, pp. 57, 101).

In Rhodesia also are found extensive gold-mines, some of which reach a depth of 150 feet. There is no reason to believe that they were worked by any but native Africans, yet the present-day natives are ignorant of mining, and have neither lamps or candles, without which the mines could not have been worked.

Farther north, in Kenya, Uganda, and Tanganyika, are found the remains of an extensive system of graded roads, and of terraces for cultivation (*Man*, 1931, p. 45; 1932, p. 208). These must have been made by people much higher in the

scale of civilization than the present inhabitants, of whom a few still use the terraces.

In West Africa we find widespread remains of megalithic buildings such as are never made by the present inhabitants. Their ancestors must have had a different, and probably a higher, culture.

For America and Northern Asia we shall begin by again quoting Dixon, who says (*Building of Cultures*, p. 280) that

> 'there are cases in which a considerable and wholesale drop in culture seems to have occurred. Thus the Yaghan of the west coast of Tierra del Fuego appear to have been crowded into this inclement and harsh environment, there to have somewhat retrograded and lost some of the cultural traits, such as the bow, which they once had possessed. The Ostiak of the Arctic shores of Western Siberia are thought to have once lived much farther to the southward, in the region of the Altai, and to have had a knowledge of metallurgy together with other traits that, since they were forced northward, they have lost. Again, the semi-agricultural sedentary woodland tribes of Algonkian and Siouan stock, who, abandoning their former habitat, moved westward out into the Plains, lost agriculture, pottery-making, and their semi-sedentary mode of life, and became buffalo-hunting nomads.'

But it is not merely tribes which moved which lost culture. We have already seen that the civilizations of Peru and of the Mayas were on the down-grade long before Columbus, and we are told also that 'the whole of the mound-building culture of the Ohio Valley had vanished before the period of discovery' (C. Wissler, *The American Indian*, p. 268).

The Pueblo or 'village' Indians are now confined to the northern parts of Arizona and New Mexico, but there was a time, perhaps a thousand years ago, when they, or the

culture which they represent, covered the whole of what is now the states of Arizona, New Mexico, and Utah, and part of Texas. This is known from archaeological evidence, particularly that of pottery. The evidence suggests that either immigrants or the introduction of culture features from Mexico brought about a period of great prosperity and fairly high culture, but that long before the advent of Europeans the area of the Pueblo culture had begun to diminish, and its inhabitants to be replaced by tribes of very low culture, such as the Apache. In traits in which comparison can be made, such as building and pottery-making, the Pueblo Indians have shown a progressive decline. (For ancient area, *v.* N. C. Nelson, in *Natural History*, xix, p. 133; pottery, W. S. Stallings, in *Am. Anth.*, 1932, pp. 67–78: Forde, *H.E.S.*, p. 238.)

Let us conclude our survey with the Eskimo, who appear to have been going down in the world for many centuries. The so-called Thule culture of the central Eskimo area included many elements not found there to-day (Forde, *H.E.S.*, p. 127), and harpoon heads found on ancient village sites in Northern Alaska are 'much more elaborate and complex' than modern ones (D. Jenness, in *The American Aborigines*, p. 385). The Eskimo used to build houses of stone or earth, which they made their headquarters. Except in one or two places, however, new houses of this type have not been built for many generations, and the Eskimo are now ceasing even to repair the old ones (Forde, op. cit., p. 114).

The preceding pages contain merely a selection from the evidence which is available to show the deterioration of savage cultures, and so far as I can learn, there is nothing whatever to put into the scale against it. It is true that savages, when transported to a new environment, seem often to have succeeded in adapting themselves to it, and of making use of products which were strange to them, if these

did not differ greatly from those with which in their earlier environment they were familiar. It is also true that when a new element is introduced from the outside into the culture of a savage people, they often seem able not merely to absorb it but to some extent to build upon it. Such facts do not affect the point, which is that while the theory of progress requires that every human group, if left alone, tends inevitably to improve its culture, all the evidence shows the exact opposite to be the case, namely, that every human group, if left alone, tends invariably to loss of culture and general deterioration.

Tylor, in the place quoted from earlier in this chapter (op. cit., ii, p. 48) says that degeneration in culture might be shown to be by no means the primary cause of the existence of barbarism and savagery in the world, but a secondary action largely and deeply affecting the general development of civilization. In this he is probably correct; the primary cause is no doubt to be found in the fact that man has nowhere succeeded in freeing himself altogether from the mental characteristics of the ape-like creature from which he is descended. But this fact, though it may be a cause of savagery, cannot be a cause of deterioration. We have no more reason to suppose that a man has a natural tendency to degenerate into an ape than that an ape has a natural tendency to degenerate into a lower mammal. Nor have we any reason to suppose that all men were once civilized, or even half-civilized. What the facts suggest is that the natural state of man is a state of low savagery, and that towards that state he always tends to revert whenever he is not checked, or forced in the opposite direction, by that unexplained, but highly artificial, localized, and spasmodic process which we know as the progress of civilization.

Chapter V

THE CONDITIONS OF INVENTIVENESS

We saw in the last chapter that progress, far from being universal, is extremely limited in its incidence both in time and space, and that the normal condition of human groups is one not of progress but of stagnation or decay. Yet the human race has made a vast number of inventions and discoveries, many of which are thousands of years old. The origin of the older inventions is lost in the past, and the reconstruction of their history must be largely hypothetical. For certain inventions we shall later on make the attempt; meanwhile let us consider the conditions under which inventions might come to be made.

We are often told that primitive man discovered this, invented that, or evolved the other, but those who tell us this never explain whether it was done by one primitive man once, by a hundred or a thousand primitive men at various times, or whether all primitive men went through stages in which they did these things. Mr. H. G. Wells, for example (*The Work, Wealth and Happiness of Mankind*, p. 36), tells us that 'the herdsman, the builder, the cultivator, were already latent in the watchful, ingenious, early human wanderer. Already, before his economic life developed, he was talking, he was imitating, he was in his manner experimenting'. Was this early human wanderer the ancestor of the Australian blacks, and if so how is it that they are neither herdsmen, builders, nor cultivators?

We are told by another writer (*Ency. Brit.*, vol. xviii, p. 358) that 'some original genius of the tribe found that by starting to build up his pot on the flattened side of a boulder he could turn his support so as to bring every part in succession

under his hand, and thus the potter's wheel was invented'. The writer, however, makes no attempt to suggest whether this absurdly improbable incident (see p. 103) occurred a thousand times or once only.

Similarly in the realm of ideas, we are told (*Oxford Dictionary of Proverbs*, intro.) that such sayings as 'a bird in the hand is worth two in the bush' originate with 'the common man'. Is it really suggested that every village contained at least one man to whose lips this form of words sprang independently?

Does primitive man, or savage man, or rustic man, really invent anything, and if the suggested answer is yes, what is the evidence? We are often told that the Bongabonga have discovered the art of smelting iron, or that the Waggawagga have invented an ingenious fish-trap, but nobody claims to have seen them doing it. Attributions of inventiveness to savages are frequent and dogmatic, but accounts of experiments actually witnessed are extremely rare and uncertain. I know of no case in which anything which can be described as an invention has been recorded as having been made by a living savage. Savages never take credit to themselves for the devices which they use, but always attribute their invention to some mythical ancestor.

The erroneous belief that the savage is an inventor has various causes. The first is the irrational idea, with which I have already dealt, that the *use* of a device in any place implies its *invention* there, at least if there is no record of its introduction. Then there is the belief that we are all naturally inventors. People who themselves have never had an idea exhibiting the slightest sign of originality have no difficulty in crediting primitives or savages with brains of the utmost fertility. The scientists in our midst invented wireless telegraphy and a host of other things, but what have Binks the banker and Brown the bus-driver invented? There are in our midst thousands of intelligent and capable

Binkses and Browns who have invented nothing whatever; can it really be believed that every savage community, however small and primitive, has produced a succession of men possessing an inventive genius such as has been totally denied to Binks and Brown?

Another fallacy is that local culture sequence implies local invention. Archaeologists in the course of their excavations often find sequences of objects in stone, metal, or pottery which show advance, and some are apt to conclude from this that the people who lived on the site were experimenters and inventors. But the fact proves nothing of the kind, even if all the objects can be proved to have been made on the spot. We are told, for example, that the evolution of the socketed celt in Europe has been traced; this could be done only if influence from outside Europe could be definitely excluded, and this it cannot be. It might be possible to find in Afghanistan examples of every type of firearm from the matchlock to the most modern rifle, with proof that they had all been made locally. This would not establish the evolution of small arms in Afghanistan; we know in fact that not the smallest improvement in the design of such weapons has ever been made there.

It is seldom realized how many and serious are the obstacles which stand between the savage and invention. In the first place, there is the intense conservatism which animates every savage community (unless it is subjected to foreign influence) and causes any innovation to be regarded as sacrilegious. The ancestors or the ancients are regarded as infallible and omniscient, and since it is deemed impossible that there could be a bow or a pot better than the ancestral bow and pot, nobody dreams of trying to make one.

Tom Harrisson, discussing war-clubs in Melanesia (*Savage Civilization*, p. 351), says that one of the commonest types 'has four knobs at the end, always and only four knobs;

not three or five knobs. No man would consider the making of other than four . . . tradition dominates this part of life as it dominates all parts.'

Not only must the potential inventor have shaken himself free from a belief in the all-sufficiency of tradition, but he must adopt a completely materialistic attitude, not necessarily towards the world in general, but towards the particular class of objects and materials with which he is to deal. Nobody can devise any improvement in the process of smelting iron, for example, unless he realizes that the success or failure of the process depends entirely on the materials and technique employed. This sounds obvious enough to the scientist, but savages, as well as many Europeans, regard the matter quite differently. With them the operator must be ritually as well as technically qualified, and failure is at least as likely to be due to faulty ritual as to faulty technique. Some magical precaution may have been omitted, some taboo unwittingly broken. Let us take a widespread European belief—that bacon will not keep if cured by a woman who is not clear of her periods. It seems to me that the process of bacon-curing could never have been discovered by people who thought like that, since they could neither observe carefully nor think clearly enough. A knowledge of this process, it should be added, is by no means universal. The inventor need not have been a chemist, but he must have been enough of a scientist to realize that meat and salt, and not taboos, were the relevant factors. The progress of invention in the last two centuries is probably due very largely to the restrictions which have been placed on the activities of the Devil, whose unexpected intervention was formerly liable to upset all calculations.

Another great obstacle to invention is illiteracy. We are so accustomed to reading and writing that we fail to realize that the illiterate lives in a world in which accuracy is quite unknown. There are rough measures of quantity, but none

of time, and no weights. And there are no calculations except very simple addition and subtraction. The savage has neither clock nor calendar, and no measure of time except the lunar month and the distinction between day and night. He has neither scales nor foot-rule, and does not even formulate the fact that twice two is four. He has nothing except the rule-of-thumb knowledge which he has acquired by watching his elders, and no conscious desire to improve upon their results. His only chance of discovering an improvement would be to hit upon it by accident, and he could then utilize it only if he remembered the exact steps by which he had reached it, if it was obviously advantageous, and if there were no magical objections to its employment.

Contrast him with the scientist: from early youth the latter is familiar with the clock, the thermometer, the multiplication table, and many other devices which enable observations to be checked and experiments repeated. Later on he can make notes of his own results, and utilize in the form of text-books and other writings the results obtained by others.

Even where records exist, however, inventions which cannot be put to immediate use are soon forgotten. Heron of Alexandria, about 250 B.C., discovered the principle of the steam-engine, but the Greeks had not sufficient metallurgical skill to make use of the discovery, so that it was forgotten, and not rediscovered for 1,900 years. This shows that the making of a discovery or invention is by itself of little importance. To be put to any use, it must be made in a society in which there are both means and inducements to its use.

Even where records and appliances exist, inventions and discoveries by no means always follow. The Romans discovered almost nothing, and the same may be said of the English before the sixteenth century. The inventions which have made modern civilization are limited to half a dozen countries. The theory of savage inventiveness compels us

to believe that genius such as has never emerged in Spain exists in every Kaffir kraal.

It is a popular belief that 'necessity is the mother of invention', but this, like most popular beliefs, is quite untrue. There is no single invention which can, with the slightest degree of probability, be ascribed to necessity. Let us take the example given by Tylor, who says (*Primitive Culture*, vol. i, p. 67) that 'the art of setting fences to catch fish at the ebb of the tide, so common among the lower races, is a simple device for assisting nature quite likely to occur to the savage, in whom sharp hunger is no mean ally of dull wits'. It should be obvious that the making of such a trap involves forethought and preparation such as is improbable in even an intelligent person who is suffering from the pangs of hunger, and if a hungry man would be unlikely to *make* it, how much less likely would a hungry savage be to *invent* it? Dull wits are in fact made duller by physical weakness.

Wissler, again, says (*Man and Culture*, p. 201) that

> 'the notion sometimes found in books that man tamed the ox because he was tired of trundling the cart is too naïve to be considered. The yoke was an afterthought, for man's first concern was the preservation of his beef supply. . . . It is far more likely that domestication and agriculture were born in times of dire necessity, when the whole tribe was confronted with a vanishing fauna or flora.'

Yet he had before him the example of the bison. Not only did the Indians make no attempt to domesticate this animal, but they slaughtered it in the most ruthless and wasteful manner.

Nordenskiold believed that the American Indians had made many inventions, yet he says (*J.R.A.I.*, 1929, p. 284), 'I am afraid that it is not always true that necessity is the mother of invention. If it were true, then inventions ought

to have been made in places where the struggle for existence was very hard. But instead they are made where the conditions of life are easy.' Dr. Harrison stated the fact more clearly when he said that 'prosperity, not need, is the mother of invention, or at least its fairy godmother', and that 'no modern invention has any relation to human needs' (*Pres. Ad. Sec. H. British Ass.*, 1930, p. 19; *Man*, 1926, p. 74). A good example is the motor vehicle: now a universal need, it was for years after its invention nothing more than a rich man's toy.

Invention depends upon experiment, and experiment is really a kind of individual play. The savage indulges little in individual play, in fact he indulges far less than the civilized man in any form of play. This fact is obscured because the savage often hunts and dances, and obviously enjoys so doing, but his dances and hunts are social obligations, and though he enjoys them, he takes part in them from social necessity. They are no more play, in the proper sense of the term, than an Irish wake. There is a vast difference between doing what you like and liking what you do; you can experiment in the former case, but not in the latter.

Any experiment may be, and nearly all experiments are, a waste of time and material. Even under scientific conditions, when the properties of the materials employed are understood, and the results recorded, it takes thousands of fruitless experiments to produce a fruitful one; under savage conditions the chances of success are much more remote.

It is often said that important discoveries have been made by accident. The truth of this saying depends on what is meant by accident. It is true that people who were looking for something have sometimes found something else, but untrue, so far as we know, that any discovery has been made by some one who was not searching or experimenting. Glass is supposed to have been discovered by the lucky accident of

some travellers lighting a fire on the sand, and finding that the fire had fused some of the sand into a transparent substance. Such an accident might happen, but the mere fact that a hard, transparent substance was found in the ashes would lead no further. It would need the combination of a skilled metal-worker and a skilled potter to utilize such a discovery, and then they would have to be experimenters.

Useful invention, then, is likely to take place only where there is experiment, but experiments, since they are mostly futile and wasteful, can only take place in communities in which there are people with material to waste, and food so easily obtained that they can afford to spend much of their time in unproductive activities. It is not until people are placed beyond the reach of cold, hunger, and anxiety that they develop the superfluous energy which may express itself in experiment. The most primitive tribes, the hunters and food-gatherers, have to devote all their energies to keeping alive; the herdsmen are perpetually on the move seeking pasturage for their herds; even savage cultivators seldom have enough to eat except just after a good harvest, and their spare energies are devoted to ritual observances and to tribal warfare.

We can see, then, what a remarkable man the savage inventor would have to be. In the first place, he would have to be indifferent to the opinion of his fellows, to whom any novelty is sacrilege. In the second, he would have to shake off all magical or irrational ideas, and adopt a purely materialistic attitude towards the subject of his experiments. These would have to be made without any weights, measures, or instruments of precision, and without any means of recording their results. Finally, he would have to live in a state in which his leisure for experiment would not be liable to interruption by the pangs of hunger, the need for movement, or by hostile attack.

In writing the above, I had chiefly in mind such inventions

as pottery and metal-working, but it applies equally to stone implements. Many of these must have been evolved as the result of experiment, and it is difficult to imagine such experiments being made by cold and hungry savages, in imminent danger from enemies and wild beasts, and in face of the disapproval of their fellows. The conditions under which these inventions were made must have been very different from those obtaining among present-day savages.

To make this point clear, let us consider some widespread devices which seem at the first glance to be very simple. Many savages make fire by revolving one stick in a hole made in another, and it is often assumed that this device is so simple that its discovery would be within the competence of any savage. But how could a savage make the discovery? That friction produces warmth is fairly obvious, but that it produces fire is far from obvious. Even those who believe most firmly in the inventiveness of savages could hardly suppose that all over the world people at a very low level of culture spent hours in rubbing two sticks together to see whether anything would happen. The method may have been accidently discovered by some one who was using a bow-drill, and people who had the bow-drill must have been long in the possession of fire. Perhaps they obtained it by knocking two pieces of iron pyrrhites together, or perhaps they merely preserved fire which had been caused by lightning or some other natural means. Even now savages do not normally make fire, but are careful to keep a small fire always smouldering on the hearth. The twirling-stick method of fire-making appears to be universally connected with fertility rites, and it seems probable that this method, with the belief in its efficacy for promoting fertility, originated in some one spot, and that the spread of the belief in its magical efficacy led to the spread of its use.

Let us take another alleged primitive invention, the cradle. The accepted theory seems to be that all over the

world savage mothers, having learnt by experience that babies ought to be rocked to sleep, put on their thinking-caps and devised a simple rocking-machine. But not only do most savage babies get on very well without being rocked, but our doctors have decided that rocking is definitely harmful to babies. The cradle, it would seem, is nothing but a miniature boat, and the custom of rocking babies is probably derived from an ancient custom of putting new-born princes into boats. We do not know the origin of this custom, but its existence is attested by the story of Moses in the bulrushes, a myth which in various forms ranges from Italy via India to Japan.

Then let us take iron-working. Over a great part of Africa iron is worked in a very primitive manner. I have seen it worked by completely naked negroes. Having crushed lumps of iron ore to a coarse powder by hammering them with stones, they throw handfuls of this powder on to a charcoal fire made in a hole in the ground, and smelt it with bellows consisting of earthenware pipes with skins tied over the ends. The lumps of impure metal thus obtained are heated in an open fire, and hammered out with round stones, with the aid of bamboo tongs. By this means quite serviceable hoes and spears are made.

If any one supposes, in spite of all the evidence to the contrary (Forde, *Habitat, Economy and Society*, p. 388), that the negroes invented this process for themselves, will he explain why a similar invention was not made in Bronze Age Britain? The Britons of that age were far more civilized than the negroes. They could build Stonehenge, whereas the negroes cannot build in stone at all. The Britons had at least as much need of iron as the negroes; at that time about three-quarters of England were covered with hardwood forest, and were uninhabited because without iron tools it was impossible to make headway against this forest. The iron ore was there; the knowledge of bronze-working

(almost entirely absent in negro Africa) was there, and the need was there, yet it was not until much later that iron tools were introduced from the Continent.

Wissler tells us (*The American Indian*, p. 7), that 'in pemmican we have our first good example of the many ingenious processes by which the various groups of mankind have converted raw foods into more serviceable and conservable forms'. We here seem to be in the realm of independent invention, but he goes on to tell us that though the inland and the coastal tribes live or lived largely on meat and fish, the practice of pemmican-making was confined to the former group. 'The trait', he says, 'seems to be almost a conventionality and leads one to suspect that the idea was borrowed from their southern neighbours, who were in contact with the grain-grinders.'

This is a good example of how a study of distributions destroys theories of primitive inventiveness. We shall consider some others later.

Chapter VI

THE BEGINNINGS OF CULTURE

MOST theories of the beginnings of culture are based on the belief, which we have seen to be fallacious, that man is naturally inventive and progressive. Thus, according to Frazer (Preface to *Anthologia Anthropologica*)

> 'It seems to be now certain that civilization has everywhere been evolved out of savagery; in other words, that at some period, probably not very remote in their history, the ancestors of all the civilized races have emerged from a state of savagery not very different from that in which many backward races have continued down to the present time.'

His dictum is very similar to that of Tylor (*Primitive Culture*, vol. i, p. 32), who goes on to say that since we know the higher culture to have been evolved from what may be called the middle culture, we must suppose that the middle culture was similarly evolved from the lower.

We know that our own civilization, in all but its latest phases, was not evolved locally, but derived from the Mediterranean. We know that Greece derived its civilization from Asia Minor, Crete, and Egypt. We, like the Greeks and Romans, have improved upon the civilization which we received from outside, but it is quite untrue to say that we evolved our own civilization. It is then clearly not the fact that civilization has *everywhere* been evolved out of savagery, and to say that it has *anywhere* been evolved out of savagery is a guess which cannot be supported by any evidence. As Niebuhr (quoted by Tylor, op. cit., p. 41)

remarked, 'no single example can be brought forward of an actually savage people having independently become civilized'. So far as we *know*, all civilization has been evolved from pre-existing civilization, not from savagery.

Of the real beginnings of culture we know nothing for certain, and it is very doubtful whether we ever shall. It seems likely that the cradle-land of the human race was in South-western Asia, where was also the seat of the earliest civilizations, yet there are fewer traces of 'primitive man' there than in many other parts of the world. Whether this is because the earliest cultures are beneath the silt of the Euphrates or the Indus, or whether their remains still await the chance disturbance of the surface at some hitherto unsuspected spot we cannot say. What we can say is that all the facts alleged as evidence of the beginnings of culture are fallacious.

They are of three types. The first is concerned with the traditions of illiterate peoples; some writers have supposed that these go back to the beginnings of culture. Frazer, for example, in his *Myths of the Origin of Fire*, seriously suggests that certain savages have preserved, for countless thousands of years, an accurate account of how their remote ancestors discovered the art of making fire. Investigation shows, however, that illiterates have no real knowledge of, or interest in, the historical past, and that it is only in exceptional circumstances that a fact not recorded in writing can be preserved for as long as a hundred years, while a hundred and fifty years seem the extreme limit. Such myths as those of the origin of fire, far from being historical reminiscences, are in all probability mythological descriptions of the ceremonial making of new fire, such as still occurs annually in many parts of the world (see p. 47). We may thus rule out tradition as a means of learning anything of historical origins, though it may give us valuable clues to magical or religious developments.

The second fallacy is that archaeology can show us beginnings. That archaeology can teach us a great deal of history there can, of course, be no doubt; it often enables us to trace movements and developments, but never origins, at least not with certainty, since archaeologists cannot dig up the whole of the earth's surface, and any conclusions they come to are always liable to be upset by later excavations.

The most striking remains of Roman civilization are found in North Africa, and if we had only archaeological evidence to go by, we might be justified in concluding that its foundations were laid there.

What applies to cultures as a whole applies equally to particular artefacts; the mere fact that the earliest or most numerous examples are found at a particular spot is no evidence of origin there. It is probable that the art of copper-working was discovered where there was native copper, but even this is not certain; it is possible that copper was traded for magical or ornamental purposes before it was worked and that the art of working it was discovered at some place to which it had been imported for such purposes. Amber is found on the shores of the Baltic, but the art of carving it probably originated on the Mediterranean. If we adopted the methods of certain archaeologists, we should have to conclude that china-clay was found at Worcester, and that Manchester was in the centre of the world's chief cotton-growing area.

It is impossible to tell from their present distribution where bicycles or sewing-machines were invented, and the same applies to any other widespread type of artefact. Among the chief results of archaeology have been to show that artefacts which were once supposed to be purely local have in fact a wide distribution, and to extend in unsuspected directions the range of prehistorical culture movements.

For the third fallacy I shall again quote Professor Dixon, who tells us (*Building of Cultures*, p. 4), that:

'The wealth of traits which a culture possesses and the stage of perfection of its traits decreases as we descend the scale of culture, until, when we reach such primitive folk as the now extinct Tasmanians, we are within measurable distance of those very beginnings of culture which set our earliest ancestors off as men.'

In other words, if we find a shipwrecked mariner reduced to a tattered pair of trousers, we may conclude that we are within measurable distance of the beginnings of clothing. For, as we have seen (see p. 34), the Tasmanians were in a situation very like that of shipwrecked mariners. Their ancestors must have made a series of voyages, and in order to do so must have possessed traits which their last descendants had lost. Nobody would expect to find out how the early Christian fathers thought and acted by plunging into the wilds of Calabria or Connemara, and it is equally futile to try to find out how the early fathers of civilization thought and acted by plunging into the wilds of Australia or Central Africa.

Against this it might be urged that we cannot suppose man to have been created in an already civilized condition, and therefore the earlier steps on the road to civilization must have been taken by savages, that is to say, by people exactly like modern savages. And if that is so, then modern savages, if left to themselves, must be capable of initiating civilizations. But the beginning of this contention should be to show that modern savages, when left alone, do make progress, and, as I have tried to show, all the evidence points in the opposite direction.

And it is not only modern evidence that we have. We know that man has been on earth for something like half a million years, yet up till about ten thousand years ago the highest men had got no farther than the condition in which the lowest savages now exist. As Elliot Smith points out

(*The Diffusion of Culture*, p. 164), it cannot therefore be maintained that man has an instinctive tendency to civilize himself.

But, further than this, we have evidence that ancient savages, when left to themselves, retrogressed just as modern savages do. Discussing the Mesolithic period, that between the Old and New Stone Ages, Peake says (*J.R.A.I.*, 1927, p. 21) that:

> 'All the evidence available suggests that the people of Europe had passed from being hunters of big game to the status of hunters of small animals, while most of them had degenerated into mere collectors of food. The different phases recognizable in their industries suggest that the period must have lasted for several thousands of years. . . . The successive phases show slow but definite retrogression, but no symptom of progress.'

In other words, at a time when the peoples of the Middle East were domesticating sheep and cattle and developing the plough and the wheel, the savages of Europe were degenerating into a state similar to that of the extinct Tasmanians.

And what happened next? Did these savages suddenly pull themselves together and start domesticating animals and growing corn? Nothing of the kind.

> 'The emmer wheat grown by the earliest neolithic inhabitants of Denmark,' says Childe (in *Independence, etc.*, Harvard, 1936, p. 6), 'and the sheep they bred are not descendants of any wild species native to Northern or Western Europe. The wild ancestors of emmer must be sought in the East Mediterranean region, and the Stone Age sheep of Europe are believed to be of Asiatic stock. Thus, in Denmark, and indeed throughout North-western Europe, the very traits, which on the economic

interpretation of history define the New Stone Age, are themselves incontrovertible evidence of diffusion. Here the food-producing economy based on the cultivation of exotic cereals and the breeding of foreign animals cannot have been evolved locally, but must have been introduced from without.'

'It was at first believed,' says Peake (*Early Steps in Human Progress*, p. 33), 'that the industry of the Neolithic Age was directly derived from that of the Palaeolithic, or at least of the Mesolithic Age, and that it was of many thousand years of duration. The idea is now gaining ground that this industry in Northern and Western Europe is derived ultimately from the south-east, and has risen from a culture in which copper was well known, though the knowledge of this metal was lost as the other elements of this civilization travelled to the north and west.'

To what extent the farmers of Neolithic Europe were immigrants, and to what extent they were natives who learnt from immigrants, is immaterial to our purpose. There is no doubt that savages are capable of being civilized; the point is that they are incapable of civilizing themselves. It is clear from the facts outlined above that not only must the theory that the Stone Age savages of Europe civilized themselves through their own instinct of progress go, but with it must go the theory from which it is really inseparable, that of 'stages of progress'. The domestication of animals and the development of agriculture will be discussed later, but here we must note the belief, quite recently extinct among scientists, that the domestication of animals was an 'easier' process than agriculture, and that all over the world man progressed naturally from hunting to pastoralism, and thence to agriculture. We have just seen that in Northern and

Western Europe neither pastoralism nor agriculture was a local development, but that both were introduced from the south-east at or about the same time. It is now realized that many pastoralists, such as the nomad Arabs, Tatars, and Somalis, are at a higher level of culture than many savage cultivators, and that many cultivators, for example, the Mayas and the Polynesians, have been quite ignorant of pastoralism. Whatever the early history of all these peoples, it is clear that the theory that agriculture is something that people naturally add to pastoralism on their way up the cultural scale cannot be sustained. There is, on the contrary, reason to believe that agriculture came before and not after the domestication of animals, at least of all animals except the dog.

We shall see later that not only cereal agriculture and the domestication of animals, but many other inventions and discoveries, can be traced, either with certainty or great probability, to one part of the world, a region which centres in Persia, and extends to Egypt, North India, and China. These origins can be traced not merely by means of such artefacts as are dug up, but by the distribution of traits at the dawn of history, as indicated by inscriptions, drawings, and carvings. We may suppose that man was evolved from the ape within this region, and carried thence many simple traits in his wanderings towards the Cape of Good Hope or Cape Horn, but all the discoveries and inventions upon which European civilization, that is to say, Graeco-Roman civilization, was based, seem to have been made within this region at a time, about the fourth millennium B.C., when the rest of the world was inhabited, so far as it was inhabited at all, by savages who, in the only area in which we know anything of them, were definitely on the down-grade.

The question then arises, were the people of Persia, Mesopotamia, etc., when they began to make all these discoveries and invent all these traits, savages? The answer

must be that if they were they must have been very different from any savages, either ancient or modern, of whom we know anything, since these latter, as we must repeat, are not known ever to have invented or discovered anything. 'Man', as Dr. Harrison says (*Pres. Ad.*, p. 5), 'did very well before he was a man at all, and no one has given any reason why he ceased to be an ape.' It is generally agreed that the ancestors of *Homo sapiens*, at any rate, emerged at one time and in one place, and we can only suppose that their emergence was due to some special and localized stimulus. That was sufficient to turn apes into what we may call palaeolithic men. It is possible that another special and localized stimulus was required to set man on the road to civilization.

Chapter VII

THE MACHINERY OF DIFFUSION

THEORIES of multiple invention depend largely upon the supposition that the normal man never leaves his birthplace. Movements, whether of groups or of single individuals, from one area to another involve movements of culture, and believers in multiple invention are therefore driven either to minimize the extent of such movements, or to ignore them altogether. The latter attitude is the more common, and it will be found that most books on the culture of savages assume as a matter that goes without saying that until the arrival of Europeans the people under discussion had never, since the first appearance of the human race, come in contact with any one from outside their own neighbourhood. Such writers as Sir James Frazer, Dr. Marett, and Professor Malinowski would no doubt reject with scorn the notion that every tribe was created independently at the spot where it is now found, yet this notion is implicit in almost every word that they have written. The theory that brings man to his present situation, wherever that may be, with his mind a complete cultural blank, is also the basis of most psychology; it would, in fact, be scarcely an exaggeration to say that psychologists do not recognize the existence of culture contacts at all. They base their theories upon instincts and unconscious impulses, qualities characteristic of the brutes and by which alone man could never have risen above the brutes. Humanity depends upon culture, in the sense in which I have defined culture, and culture depends upon movement. As I have tried to show, human groups which remain isolated in one spot always degenerate, and I shall now try to show that in the history of the human race such groups are rare.

It is generally agreed by anthropologists that all human beings are of one stock, that is to say, that there is one area, and one area only, in which the ancestors of us all, whether we are white, black, yellow, or red, crossed the line which divides the sub-human from the human, or at least from *Homo sapiens*. Exactly where that area was, and what were the causes which brought about subsequent racial differentiation, are beside the immediate point, which is that since our human race became human in one area only, it is as human beings that the race has spread over the world. Nor is it necessary to discuss whether man or culture came first. There is now, at any rate, no culture apart from *Homo sapiens*, and the brain which gives him a title to *sapientia* can hardly have been developed without some culture. Whether the improved brain initiated the culture or the incipient culture led to the development of the brain we cannot say, but we can hardly doubt that where *Homo sapiens* first came into existence, there were the beginnings of culture.

It may be that when men first left their original home, and started upon the long journeys which were to take their descendants to the ends of the earth they had already learned to speak, to make stone axes, and to use fire, and had domesticated the dog. All modern groups, however remote and however savage, must have some part at least of their cultural heritage which was evolved by ancestors living in a different environment.

There can be little doubt that Fuegians, the very barbarous and 'primitive' inhabitants of the extreme south of South America, are, like all the pre-Columbian Americans, the descendants of immigrants from Asia. What can have induced the descendants of people who had wandered something like 15,000 miles through Asia and America to settle in this inhospitable region we cannot guess, but it should be obvious that their culture can be in no sense aboriginal. It must once have included Asiatic, polar, and

tropical features, and the machinery of diffusion in their case must have consisted in bringing a mixed culture many thousands of miles, and losing most of it on the way.

The ancestors of the Tasmanians must have travelled at least 3,500 miles, including several sea-voyages, and almost certainly had a higher culture than that of their last descendants.

The machinery of diffusion consists, then, in the first place, of groups of people gradually pushing out in all directions from the original homeland of mankind into lands where human beings had never appeared before. The larger the cultural equipment with which such a movement started, the farther it would be able to get, and the more chance there would be that it contained features which would enable their possessors to come to terms with different local conditions and survive.

Let us consider this point in relation to the Eskimo. The usual view is that the Eskimo are people whose instinctive inventiveness has enabled them to survive the rigours of the arctic winter. But how could this have come about? It cannot be believed that savages accustomed to a temperate climate could survive in an arctic climate long enough to adapt themselves to it; nor is it easy to believe that the ancestors of the Eskimo were polar explorers who devised a suitable culture in advance.

The fact is that the culture of the Eskimo contains much that is found among the Lapps and the tribes of Northern Siberia, and also farther south among the Mongols and Tatars. It is generally agreed that they must have reached the northern shores of America from Asia, and whatever caused them to migrate, the probability is that they started with a more complex culture than that which they now possess. Their adaptation to their environment probably consisted in dropping whatever elements were unsuited to it.

The second type of machinery by means of which diffusion

is brought about is conquest. This takes two forms—in the simpler and probably earlier, a group of migrants occupies an area already inhabited by a weaker group. Even when the invaded are at a much lower level of culture than the invaders, they usually possess some traits which the invaders lack, so that there is a period of comparison, adaptation, and development until the two groups become completely merged. Then, unless there are fresh contacts with the outside world, there follows the inevitable slow decline.

In the second type of conquest the conquerors maintain their connexion with their homeland, or with their kinsmen who have conquered other areas, and in consequence do not merge so readily with the conquered. This type of conquest results in the formation of empires. We may define an empire, in its simplest form, as a community consisting of two or more once independent groups under the suzerainty of one of them. We are so much accustomed to regarding England, France, and Germany as countries that we do not realize that it is more or less recently that they ceased to be empires. England under the heptarchy was a number of independent states; it later became an empire under the suzerainty of Wessex. Later still it formed part of the empire of Canute, and it was not until after the Norman Conquest that it became one country, forming part of an empire which for four hundred years usually included a great part of France. France cannot be said to have become a country till the time of Louis XI, and its boundaries were altered as recently as 1918. Nobody can now say with any confidence where Germany begins and ends. In the eighteenth century Bavaria could fight beside France against the rest of Germany without any feeling of treachery, and Bavaria was formed out of a number of what had been independent communities.

Let us bear these facts in mind when considering the remote past, and try to realize that Egypt, Persia, Babylonia, and China were formed by conquest out of numbers of

independent communities, and were themselves empires long before they became countries with empires attached. Even the smaller groups of which they were composed were probably formed by the forcible fusion of towns and villages.

Writers are far too apt to speak of Egypt, Babylonia, or China as if they were countries with permanently fixed frontiers and homogeneous populations possessing an entirely distinctive culture. Modern Egypt includes Sinai, which is geographically in Asia, and about one third of Nubia; Ancient Egypt was formed by the fusion of the 'Two Lands', of which one had probably been in close touch with Syria, and the other with Ethiopia. Not only was it composed of people of very mixed racial and cultural ancestry, but from the earliest times its culture was repeatedly transformed or greatly modified by influences from without. 'As far as our knowledge goes at present,' says Professor Peet (in *J.E.A.*, vol. x, p. 67), 'there is a complete break between the palaeolithic and the predynastic,' and the same kind of thing happened again and again in later times, though as the civilization of Egypt became more complex, the result of these alien influences was less marked. The same applies to the other great civilizations of the Ancient East; far from arising in geographical isolation, they derived from the combination of diverse elements.

An empire, then, comes into existence in two main stages. In the first the nuclear group becomes the leader of other groups which owing to nearness in race, culture, or actual position can be fused with it into a 'nation'. Strengthened by this fusion, it proceeds to conquer remoter groups with which it either cannot or will not fuse. The process of diffusion is just as real in the first stage as in the second, but is less obvious since by its very completeness it has effaced its traces. The importance of the empire in its second stage for the diffusion of culture hardly needs emphasis. Quite

apart from trade, which can exist without empires though it flourishes more easily within them, there is always a stream of officials and soldiers passing to and fro between the capital and the provinces and carrying ideas and artefacts backwards and forwards, so that the most confident advocates of multiple invention scarcely dare to postulate it within the bounds of a political unit.

The extent to which imperialism existed in the ancient world is unknown, but enough is known to convince us that it was very great. The empire of Egypt, in the fifteenth century B.C., seems to have included parts of what are now Turkey, Iraq, and Abyssinia, and the empires of the Babylonians, Hittites, and Assyrians were of wide extent. The empire of Alexander stretched from the Adriatic to the Indus, but even so it was but little larger than that of the Persians which it succeeded, whose Greek subjects were able to travel in comfort and security to the Nile or the Persian Gulf. There was never, so far as we can tell, room for a really independent civilization within this vast area. How far the rule of Mohenjodaro extended we do not know, but we do know that from the earliest times it was in contact with Mesopotamia.

It is unknown how early the Chinese Empire came into existence, but there is no truth in the idea that Chinese civilization came into existence in isolation. For many centuries before the Christian era there had been a well-trodden route from Persia to China via Samarkand and the Tarim Basin, and along this route the vine, the olive, and the sugar-cane reached China, which sent much in return.

> 'We now know', says Laufer (*Field Museum Pub.*, no. 184, p. 185), 'that Iranian peoples once covered an immense territory, extending all over Chinese Turkestan, migrating into China, and exerting a profound influence on . . . Turks and Chinese. The Iranians were the great

mediators between the West and the East, conveying the heritage of Hellenistic ideas to Central and Eastern Asia, and transmitting valuable goods and plants to the Mediterranean area.'

The latter included silk, and much later the silkworm, which reached Persia in the fifth, and Constantinople in the sixth, centuries of our era.

At the same time there were routes by sea and land between India and China, along which went not only ambassadors and traders, but also the missionaries who converted China to Buddhism.

Intercourse between China and Western Asia continued throughout the Middle Ages. Many fragments of porcelain of the late T'ang period (ninth century) have been found in Mesopotamia, while Persian influence is evident in Chinese art of the same period. In the twelfth century we find Chinese influence transforming the old Persian art forms (G. D. Hornblower in *Islamic Culture*, 1931, p. 599; 1932, p. 76). The Mongols, whose empire in the thirteenth century extended from the Pacific to Poland, kept up the connexion between East and West. They introduced to Europe the Chinese art of block-printing.

During the whole period when Chinese civilization was on the upgrade, and long after it reached its prime, China was in continuous contact with the civilizations to the west and south. The attitude of deliberate isolation and of hostility to foreigners was only adopted during the last few centuries, the centuries of decline.

We see then that the great empires of the East, with their oft-changing frontiers, covered the whole of Asia except the extreme north, as well as Egypt and South-eastern Europe, rendering this vast region to a great extent one single culture area, throughout which new ideas, new processes, and new materials were continuously circulating. And what of

the rest of Europe? Its late entry into the field of civilization is due to the fact that it was remote from the Eastern empires and until Roman times did not develop an empire of its own. We know, however, that from the earliest times it had been continually subject to conquest and colonization. The people who introduced agriculture and the domestication of animals were, as we have seen, invaders or at any rate colonists, and from that time on we have a succession of tribes coming in, often by the Danube Valley, and spreading over the length and breadth of the Continent a corresponding succession of culture traits derived from the East (cf. V. G. Childe, *The Dawn of European Civilization*).

Besides the type of empire, such as that of the Romans, which is based on conquest and domination, there is another type, based on sea-power and trade. Of this type the most familiar to us is that of Carthage, which never ruled any great extent of territory, but possessed about thirty wealthy colonies along the coasts of North Africa, Spain, and Italy, and for several centuries controlled the trade of the Western Mediterranean.

It seems, however, that the Carthaginians were not the first in this field, but that a thousand years before them there had been a people whose sea-borne colonists and traders reached places far more remote. Where the megalith-builders originally came from is uncertain, but their remains, of which in this country Stonehenge is the most famous, are found chiefly along the southern and western coasts of the Iberian Peninsula, France, and Britain, and extend to Denmark and the adjacent lands. They are rare in the central and eastern parts of these countries, except Denmark, and are unknown in Central Europe. The size, number, and distribution of megalithic monuments makes it clear that about 2000 B.C. there was a people with its headquarters in Southern Iberia which had an established trade-route with colonies in Brittany, along the western coasts

of Britain to the Orkneys, and thence to the Skager Rak. (W. H. R. Rivers, in *Essays to Ridgeway*, pp. 489–90; C. Daryll Forde, in *Am. Anth.*, 1930, p. 28.) A similar movement was probably responsible for the stone erections with which many of the Pacific islands are studded, and which were made by an imperial people of whom the Polynesians are the degenerate descendants.

An empire similar to the Carthaginian was that of the Malays, who, about the tenth century of our era were carrying Chinese porcelain to South Africa.

Many of the ancient empires of whose existence we know disappeared leaving scarcely a trace. In Spain the megalith-builders have left monuments, as have the Romans and Arabs. The last two have left linguistic remains, as have to some slight extent the Celts and Goths. The Carthaginians have left nothing recognizable at all; the Vandals only the name Andalusia. Yet all these peoples must have contributed not merely to the racial but also the cultural make-up of Spain.

There are enough monuments to show that Rome ruled North Africa as we rule, for example, Malta, but it is only the survival of literary evidence which enables us to realize that what are now Algeria and Tunisia were once so thoroughly Romanized that many eminent 'Romans', such as Terence the dramatist, the emperor Severus, and Augustine, the most illustrious of the Latin fathers, were actually Africans. The number of real Arabs who entered these lands was small, and though the whole culture is now superficially Arab, it contains many Roman elements, and probably Carthaginian ones as well.

What has moulded the later cultures of these people is not the actual Arab conquest, but the Moslem religion which was its driving force, and we have here a striking example of the influence of religion as a culture spreader, and of the fact that there need be no correlation whatever between

culture and race or geographical environment. That Christian missionaries succeed in converting people of all races is a commonplace, but it is less well recognized that the other major religions have been similarly successful. The Buddhism of India spread over Ceylon, Indo-China, China, and Japan, and was then displaced in its own home by Hinduism. The latter spread over Indonesia, but there, as in a great part of India, it was displaced by Islam. The Syrians, Egyptians, and North Africans took as readily to Islam as they had a few centuries before to Christianity, and Islam has been successful among such widely different peoples as those of Bosnia, Turkestan, Java, and Nigeria. It is often alleged to be the religion of the desert, but this is quite untrue. Mecca, where it originated, is described by O'Leary (de L. O'Leary, *Arabia Before Muhammad*, p. 148) as 'extremely cosmopolitan . . . a clearing house and banking centre for the trade of Western Asia,' in touch with Syria, Persia, Abyssinia, and India.

Much the same applies to Judaism. It is now recognized that many, perhaps most of the Jews of Eastern Europe are descended from Tatar converts, and of the hundreds of thousands of Spanish Jews it is impossible that more than a small proportion could have been of Palestinian descent.

The history of religion shows that while in theory it is easier to diffuse an artefact than a religious belief, in fact it is the other way round. It may be easier to teach a Baganda to ride a bicycle than to accept Christianity, but if Uganda were cut off from the outside world, there would probably in fifty years' time be still many traces of Christianity, but none of bicycles.

> 'How many native races at the present day', says Elliot Smith (*Essays to Ridgeway*, pp. 541, 543), 'are unable to extract metal from the ores lying at their doors, and would barter all that they possess for a bit of copper wire or the

simplest metal appliances? Yet such people can build Christian chapels . . . and the native Wesleyan chapel in Tonga is due to British influence, even if the excavator finds no British crockery on its site.'

Our conclusion must be that any community which borrows arts and crafts from outsiders is likely to be more deeply indebted to them for ideas and beliefs.

There is no part of the habitable world which has not been reached by migrants, conquerors, traders, or missionaries, and it is evident enough that migrants take more with them than merely their bodies, conquerors more than their weapons, traders more than their wares, and missionaries more than their doctrines. But far-reaching as are the activities of these four classes, there is yet another process by which diffusion is brought about. Savages are, as we have seen, incapable of devising improvements to their cultures, but they are capable of borrowing from their neighbours traits which arouse their envy, if not too complex.

One example of such borrowing is the horse in America. In pre-Columbian times there were no riding animals in America. Horses were introduced by the Spaniards, but their use spread so rapidly that many tribes, when first seen by whites, were already horse-users (C. Wissler, *The American Indian*, p. 34). Another example is tobacco in Africa. It is believed to have been introduced into South Africa by the Portuguese, at what date is unknown, though probably early in the sixteenth century. Within a century and a half the Dutch found all the tribes which they visited growing and using it (G. M. Theal, op. cit., p. 268). I have seen villages on the frontier of the Sudan towards Uganda whose sole crop was, and had been from time immemorial, tobacco grown for barter.

We thus see how rapidly traits can travel about the world, even before the days of steam and petrol, how easily their

track can be lost, and how easily the observer, if he is ignorant of history, can be misled into regarding them as aboriginal. History also teaches us how political changes, by breaking up empires and closing trade-routes, can cause countries which had once been in close touch to become completely isolated from one another. Abyssinia, once linked to the rest of Christendom up the Nile and along the Red Sea shore, is now an island in a sea of Islam. Madagascar has long lost touch with Sumatra. We see then that there is no justification for Dixon's dictum that:

> 'Where distribution is continuous, it is fair to assume that the trait had its origin somewhere within the region over which it is spread . . . where the distribution is discontinuous, the possibility that each area represents a separate independent invention at once arises' (*The Building of Cultures*, p. 66).

It is quite obvious that the possibility that the Christian religion was independently invented in Palestine and Abyssinia, or the Malay language in Sumatra and Madagascar, never arises at all. The dictum was merely put forward to bolster up the theory, which Dixon held when he wrote the book, that the pre-Columbian cultures of Middle America could not possibly have been influenced from the Old World. As we shall see farther on, he later found reason to modify this theory.

History and archaeology indicate a vast series of culture movements. History covers but a small part of the earth's surface and a small fraction of the time that man has been on earth, and our archaeology is very limited in its range. Yet infinitesimal as our knowledge of the past is, it is sufficient to show us that, for a great part of the Old World at any rate, the picture which is often drawn for us of small independent communities building up their own culture,

and progressing by their own innate inventiveness from food-gathering to food-producing, from stone to metals, and from magic to religion, is not merely false but utterly absurd. For other parts of the world, and in particular America and Negro Africa, our historical knowledge is almost nil and the archaeological evidence disputed. I shall, therefore, leave the consideration of their problems until I have considered in some detail what is known of the origin and distribution of certain well-known and widespread inventions.

Chapter VIII

THE BOW

In the foregoing chapters I have tried to show, in more or less general terms, that the usually accepted theories of invention are fallacious. In the following chapters I shall consider certain inventions in detail, and shall show that those who have made a scientific study of them have in almost every case been driven to the conclusion that, however simple and obvious familiarity makes them seem to us, they must, in fact, have been made once only at one place, and thence diffused to the rest of the world. I shall begin with the bow, but before actually reaching it shall have to make what may seem a digression.

In parts of West Africa flintlock muskets, of a type similar to those used in Europe a hundred and fifty years ago, are still used by the natives. Nobody, however, maintains that the West Africans produced these muskets by a process of independent invention, and that it is only owing to the backwardness of their culture that they have not a more efficient weapon.

On the north-west frontier of India there is a well-known factory at which certain Pathans make breech-loading rifles of a crude but fairly effective type, and in this area many firearms of older pattern are also to be found. Nobody suggests, however, that the Pathans have progressed from muzzle-loading to breech-loading rifles by a process of independent invention.

There is no theoretical impossibility in the idea that the West Africans might have invented muskets, or that the Pathans might have progressed by themselves from the muzzle-loader to the breech-loader. It might plausibly be

argued that the skill and ability which the natives of these areas display in many directions, and in particular the ingenuity with which the Pathans make rifles by the aid of very primitive appliances, indicate the probability that they invented them. That such arguments are not put forward is due, not to any *a priori* theories, but to the known historical facts, which are that these firearms, or their prototypes, were not invented locally, but introduced from Europe. We can thus see that quite plausible theories, when checked against the facts of history, may be found to be untenable.

Let us bear this in mind when considering the bow. The bow and arrow might theoretically have been invented independently in many parts of the world, just as the musket might have been invented independently in West Africa and in Afghanistan. Our knowledge, however, enables us to say that the musket was not thus invented independently, but was diffused from one centre. To bear this fact in mind is surely the only scientific method of approach to the study of the bow. We cannot know for certain the history of the bow, and any reconstruction must in part be guesswork. A guess which is based on analogy is, however, much more likely to be correct than a guess which runs counter to all analogy.

The fact is, as we have seen, that firearms, although they might theoretically have been invented independently in Asia and Africa were in fact diffused to those continents from Europe, and analogy suggests that the bow, though theoretically it might have been invented independently in different places, was in fact diffused from one centre. Analogy does not, of course, prove this; it merely makes it the most probable line of investigation, a line which we should be content to follow unless its improbability is demonstrated on other grounds.

Having arrived, then, at the initial probability that the bow was diffused from a single centre, we must consider

whether this probability is strengthened by: (1) its actual distribution; (2) the extent to which it is a necessity; and (3) the simplicity or complexity of the steps needed to invent it. We may well consider that the wider its distribution, the more general its necessity, and the simpler the steps required to invent it, the greater the likelihood that it was invented independently in different places.

Taking the first point, we find that although the bow is very widespread in its distribution, it is not found in Australia and other remote parts of the world, whereas the gun is now almost universal. Therefore, other considerations apart, the gun is more likely than the bow to have been invented independently in different places.

Coming to the second point, we find that the gun is now used all over the world as a means of killing enemies or game at a distance, and is universally regarded as the most effective weapon for this purpose. This is not the case with the bow, which has always had powerful rivals. These include the boomerang, the blow-gun, the throwing-spear, and the sling; and while the boomerang is used by people who, so far as we know, have never had the bow, yet the throwing-spear, the sling, and the blow-gun have certainly been used, both in ancient and in modern times, by people who knew the bow but preferred those weapons to it. On the ground of universal need and universal approval then, the gun is more likely than the bow to have been invented independently in different places.

Many people find it difficult to grasp this idea. They have been brought up from an early age to regard the bow as the natural weapon of the primitive hunter or warrior, and therefore tend to suppose that the first thing that *Homo sapiens* did, as soon as he left off being an ape and became definitely *sapiens*, was to make himself a bow and some arrows, and go out shooting mammoths or whatever may have been the local big game. Their belief has been fortified

by the fact that in the early cave-paintings of Spain naked savages are shown shooting large animals with bows and arrows. 'The bow and arrow', they exclaim triumphantly, 'is the kind of thing that would occur naturally to any savage, and the paintings prove it. They show that the bow was invented by the earliest and most primitive people of whom we have any knowledge' (cf. *Man*, 1935, p. 194). But apart from the fact that the Australians, among others, have never invented the bow, although it would be most useful to them, we may well doubt whether people who could make realistic paintings were really 'primitive', and we have no reason to believe that the bow was invented in Spain. During late palaeolithic times 'there had been a constant movement into Spain from North Africa, and it is from this quarter that we must conclude that the bow and arrow were introduced into Europe' (H. J. Peake, *Early Steps in Human Progress*, p. 70).

And now to our third point; is the bow a simple invention? It is only our familiarity with it which could make us think so. Huxley's description of it as 'a rather complicated apparatus' is really an understatement, and it is, in fact, a very complicated apparatus, and one which must have taken many steps in the making. Every artefact except those of the very simplest character, such as a piece of stick deliberately broken off, is the product of two or more steps, and you cannot take the second step until you have taken the first, nor the third until you have taken the second. Now what is a shooting-bow? It is a flexible piece of wood or other material to the ends of which a string is fastened in such a way that it can be used to propel a miniature spear through the air with sufficient force to cause a fatal wound. Its construction involves the application of a number of important discoveries in mechanics and technology. Let us begin with the arrow, for which the following steps are required:

(1) The invention of the spear. The obvious way to use a stick as a weapon is to strike with it and not to use the point. The spear may have been developed from the digging-stick, a sharpened stick used for digging out edible roots or small animals.

(2) Having learnt to use a pointed weapon, the next step would be to throw it, but for this purpose neither a digging-stick nor a thrusting-spear is effective. A lighter, better-balanced weapon is required.

(3) The next development would be the idea of using a mechanical aid to throwing, such as the stick with peg or notch used as a spear-thrower.

(4) There must then come the idea of reducing the throwing-spear to a size small enough to enable it to be used with the bow.

Meanwhile, the bow must have been developed, and this would require many steps:

(1) The first must be the invention of string, or some material which can be used for the same purpose.

(2) The second is the invention of some process, such as drilling or sawing, in which string is kept taut.

(3) The third is the invention of a knot which will hold tight.

(4) The fourth is the discovery that the string can be kept taut effectively if tied to each end of a stick, and

(5) Still more effectively if the stick is flexible.

We now have a bow, but not yet a shooting-bow. What the first bows were used for is uncertain, but it must have been some purpose, such as drilling for fire, which had before been attained by some similar but less effective process. At this stage it might have been accidentally discovered that a bow would propel a small object, but unless

comparison with the spear-thrower had led to its being tried with a stick, it might have become and remained a pellet-bow, such as is still used in Brazil and elsewhere.

Whatever the exact steps by which the bow and arrow came into being, it could at first have been nothing more than a toy, and it must have taken a long period of experiment, practice, and development before it could be used to kill anything at all. The development of the shooting-bow, in all its early stages, must have been purely a leisure activity, since until it could be used effectively in hunting or war it had no value.

We see, then, that the bow is a very complex invention. That is, of course, one reason for doubting whether it was invented independently by primitive savages in various parts of the world. The positive case for its diffusion, however, is based on other considerations. Wissler says of the bow that:

> 'This implement is widely distributed throughout the world and differs in form and efficiency from region to region; yet it is generally believed that all its forms are based upon a single invention which originated in one tribe' (C. Wissler, in *The American Aborigines*, p. 211).

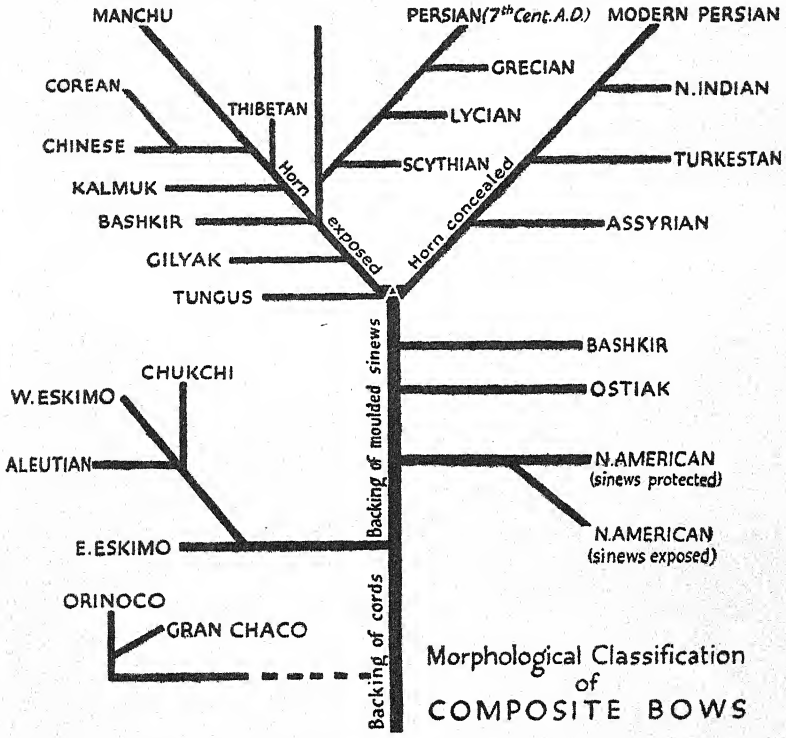
By 'generally' he means no doubt among students, and their opinion is based chiefly upon the distribution of the various types of bow and the various methods of its use.

There are, of course, many types of bow, but Professor Balfour (*J.R.A.I.*, 1921, p. 291) classifies them into four principal groups:

(1) The plain or 'self' bow, consisting of a single stave, usually of wood.

(2) The compound bow, built up by uniting two or more staves of similar material.

(3) The composite bow, in which the bow is formed



Morphological Classification of COMPOSITE BOWS

Below A *the bows are of wood or horn.*
Above A *the bows are of wood and horn.*
(after Balfour)

by the union of staves of different materials, such as wood and horn.

(4) The sinew-backed bow, in which increased strength and resiliency is given by a layer of sinews applied to the side farthest from the archer.

It should be clear that these four types are in ascending order of improvement, type two being more complex and effective than type one, and so on. According to the theory of independent invention, we should expect to find examples of each class in every region in which the bow is used, the more 'advanced' communities using the more complex types and the more 'primitive' the simpler types. In fact, however, we find nothing of the kind. We find, for example, that the sinew-backed bow is used not only by such civilized peoples as the Chinese and Persians, but also throughout Siberia and a great part of North America. Yet although the sinew-backed bow is found in the remotest parts of the Asiatic continent, it has not reached the islands. The Ainu of Japan still use a plain bow, similar to that of the Philippines and Indonesia (R. U. Sayce, *Primitive Arts and Crafts*, p. 23) and poison their arrows in the same way. Wissler thinks that the sinew-backed bow, both of the Old World and of North America, was diffused from somewhere in East Central Asia (C. Wissler, *Man and Culture*, p. 132). Professor Balfour's classificatory diagram of the composite (including sinew-backed) bows of Asia, South-eastern Europe, and America shows them all as branching off from a single stock (see p. 77).

The composite bow is totally unknown in Negro Africa, though the plain bow is there almost universal, and an elementary type of compound bow is found in parts of Uganda (L. S. Leakey, in *J.R.A.I.*, 1926, p. 263). We may note that the King of Kitara (in Uganda) used at his installation to perform a rite of 'shooting the nations', at which he shot

one of four sacred arrows to each of the four quarters of the globe. A similar rite was performed by the Pharaoh at his coronation and at the *sed* festival, and Professor Seligman, who describes these rites, says: 'I scarcely doubt that this "shooting the nations" is derived from the Egyptian *sed*' (*Egypt and Negro Africa*, p. 18). If bow ritual reached Negro Africa from Egypt, the bow itself may well have gone the same way.

The only student of bows I can find who believes that they have been invented independently by various primitive tribes is P. W. Schmidt (*Zeitschrift für Ethnologie*, 1925, pp. 63 ff.). He points out that the most primitive people known, the pygmies of the Congo, use a primitive type of bow which closely resembles that of the Negrito and Negrillo tribes of Malaya and Indonesia, and that other primitive races, such as the Ainu of Japan and the Gez-Tapuya tribes of Eastern Brazil, have bows which resemble these not only in their essential features, but in such details as the way in which the feathers are attached to the arrows. Similar bows, he says, along with others of more advanced type, are found in Siberia and many parts of North America.

The conclusion he draws is that if the pygmies and the others mentioned had obtained their bows from more civilized races, they would have obtained more advanced types of bow; therefore they must themselves have invented the bow, and passed it on to the more civilized races who improved it. By this argument we should have to conclude that, since the West Africans have the most primitive type of firearm, they invented firearms and passed them on to the Europeans. P. Schmidt's facts tell strongly in favour of diffusion. If all these tribes had invented the bow independently, it is most unlikely, to say the least of it, that their bows would resemble each other so closely, both in essentials and in details.

Besides the types of bow, we must consider the methods of using it, and in particular of releasing the arrow. Arrow releases are of four main types:

(1) The Mongolian or thumb release. In this release the thumb is bent, and a ring or glove used. It is, or was, employed in China, Japan, and Central Asia, Northern India, Persia, and Turkey. Also by one small tribe of Northern California.

(2) The Mediterranean release, in which the thumb is not used. The area of this release forms a belt round that of the Mongolian release. It is, or was, used over nearly all of Europe, in Egypt and Arabia, Southern India and Indo-China; also by some tribes of Southern California and Arizona, and probably by the Aztecs. In Egypt there is evidence for its use about 2000 B.C.

(3) A release in which the arrow is held with the thumb and first finger, but the string is pulled with the fingers only. This is used by the Malays and Melanesians, and is general along the western coasts of America.

(4) The simple release, in which both arrow and string are pinched by the thumb and first finger. Found in out-of-the-way parts of Africa and America, and in some of the Pacific islands.

Some of the more advanced releases have been reported from Africa, but in general the African bow is a poor weapon, and its releases have not been carefully studied. (For a general discussion of arrow releases, see A. L. Kroeber in *University of California*, pub. in *American Archaeology and Anthropology*, vol. 23, p. 291.)

The Mongolian release seems to be much the most effective. Sir Ralph Payne-Gallwey says that with the thumb-ring he can bend a strong bow much more easily and draw it a great deal farther than with the ordinary European finger-grip (*The Cross-bow*, app. 2, p. 12). There

seems also to be no doubt that the Asiatic sinew-backed bow is the most efficient type of bow. This type of bow, and the Mongolian release, which is believed to have been known in China as early as 100 B.C., have a focus in Eastern, or East Central Asia. Outside their area the less effective types of bow and the less effective releases are ranged in what may be fairly described, even allowing for our incomplete knowledge of the bow in Africa, as a series of concentric rings. The evidence from distribution, then, far from suggesting a multiple origin for the bow, indicates Chinese Turkestan, or some region in that part of the world, as the area in which the bow was invented and developed, and from which a succession of improvements was gradually diffused to the rest of the world.

But while the strongest argument for the diffusion of the bow from one centre is the distribution of its types and methods of use, there are a number of other arguments to reinforce it, besides the general considerations which we have already discussed. There is first the fact, which I have mentioned before, that the Australian aborigines have not got the bow, although they have suitable materials for making it, and although it would be most useful to them for hunting kangaroos and emus. If the bow occurred naturally to the pygmies, there is no conceivable reason why it should not have occurred naturally to the Australian blacks.

Then there is the fact that many tribes which are known once to have had the bow have either lost it altogether, or retained it only as a ritual object or a toy. And this although their mode of life has long remained unchanged.

Rivers (in Westermarck's *Festkrift*, pp. 109 ff.) gives many examples from Oceania. He tells us that in many parts of Polynesia and Melanesia, in which the bow was formerly used in war, it is now used only for shooting birds or fish, or as a toy, or has disappeared altogether. In parts of New

Guinea where it is no longer used, it still figures symbolically in ritual. He concludes that:

> 'It is clear that the bow and arrow are not indigenous to Oceania, but were introduced by an immigrant people, perhaps the ancestors of the Polynesians, with whom it was the principal weapon. Its falling into desuetude may be due to the differing conditions of island warfare, either tactically or from its ill adaptation to the war ritual.'

In many parts of Africa the bow has been replaced as the principal weapon for war and hunting by the throwing spear. Among the Zulus, for example, the bow has gone out of use among the men, but is still used as a toy by the boys (R. U. Sayce, op. cit., p. 141). Whatever the cause of this, it is not the superior efficacy of the iron spear, since the Bube, a tribe of Fernando Po, have only a wooden spear, but have lost the bow. This is shown by the fact that they still have a word for arrow, and use a modification of the bow as a musical instrument (H. H. Johnston, *George Grenfell and the Congo*, vol. ii, p. 955). It can hardly be supposed that these tribes, and many others which could be mentioned, went through the processes of inventing and developing the bow, and then threw it away. It is far more probable that they adopted it by borrowing, and discarded it because it did not fit properly into their social organization.

The last point which I shall make in favour of diffusion is that if savages had invented the bow, they would still be inventing improvements to the bow, and there is no evidence that any savage has ever been known to attempt anything of the kind. That the Turks or Tatars should not attempt improvements is easily to be understood, since they have, or had, bows which seem to have reached the acme of efficiency, but many savages still use ineffective bows which

could be made more effective with a little ingenuity. Far from attempting to improve them, however, they are content to copy blindly the bows of their forefathers. Some tribes of Nigeria used to string their bows by the frontal method, which involves a notch in the end. They have now adopted the methods used by certain neighbouring tribes, but still make the notch, though without knowing why (L. S. B. Leakey, loc. cit., p. 263). The Kois of the Godavery used to poison their arrows till the British Government forbade the practice. They have now lost all memory of the poison, but still make the poison grooves in their arrow-heads (J. Hornell, in *J.R.A.I.*, 1924, p. 335). Many savages feather the arrows, but seem not to know the reason for doing this. The last Indian hunter in California did not know that the arrow revolved in its flight (C. Wissler, *Man and Culture*, p. 293). Skeat found that the Semang of Malaya fixed their feathers in such a way that they produced only the slightest effect upon the flight of the arrow, and questioned whether it was not 'the mutilated survival of more intelligent methods' (Skeat and Blagdon, *Pagan Tribes of the Malay Peninsula*, vol. i, p. 275).

The case, then, against the popular belief that the bow is the kind of thing which any savage might think of, and which many savages all over the world have thought of, is based in the first place on the fact that the bow is a highly complex device which would require many steps and much time to bring it to a stage in which it would be of any practical use. Secondly, the various types of bow and methods of its use are distributed over the world in such a way as to suggest that it was diffused from some one centre, probably in East Central Asia. Thirdly, there are many savages who do not know the bow, and many others who know it, but have ceased to make any practical use of it. Fourthly, no savage is known to have made any experiment or other attempt to improve the bow, and savage bows are made in blind

imitation of those made previously, without any understanding of the mechanical principles involved, or the reasons for making them in that particular way.

To deal with bowstrings and the various methods of attaching them to the bow, with arrow-heads and methods of attaching the feathers, and with the different purposes for which bows are used, would require a large volume, but the foregoing should suffice to show that the facile generalizations of the multiple inventionists are no more justifiable in regard to the bow than in regard to other elements of human culture.

NOTE ON THE ENGLISH LONG-BOW

The English long-bow is interesting from the fact, among others, that it is the only development in archery, other than the cross-bow, of which we have any historical evidence, and it is remarkable how slight that evidence is. The short-bow was known both to the Normans and the Saxons, but the long-bow first figures prominently at the Battle of Falkirk, in 1298, at which the defeat of the Scots was due to the English and Welsh archers. Edward I had employed archers, whether long- or short-bowmen is unknown, in his Welsh wars, but in the accounts of his earlier battles, those against De Montfort, there is no mention of the bow at all.

These facts are drawn from Oman (*The Art of War in the Middle Ages*, vol. ii, pp. 59–61) who states that two areas possess claims to be the home of the long-bow. One is South Wales, whose sole witness seems to be Giraldus Cambrensis. He, writing about 1190, says that the South Welsh were great archers, and used bows of rough, unpolished elm. The other area is the Weald of Kent and Sussex, the claim of which is based on a particular mention of archers from there early in the thirteenth century. It does not seem that the bow of either of these regions could

have been the long-bow as used at Falkirk, and later, of course, in France, and we may perhaps suppose that this weapon was gradually evolved by the combined efforts of the English and Welsh archers during the long campaigns in Wales and Scotland. It seems not to have been known on the Continent before the Battle of Crécy (Payne-Gallwey, op. cit., p. 32).

The long-bow, in spite of its reputation, was not a very powerful weapon. Payne-Gallwey estimates its extreme range with a war arrow at 250 yards, and its maximum effective range at about 150 yards (op. cit., pp. 22–3). It seems to have been a plain bow of yew, and it is remarkable that the Crusaders, during their long contact with the Orient, learnt neither to reinforce their bows with horn or sinew, nor to use the more effective Mongolian release.

It is often said that yews were planted in the churchyards to provide bow staves. They were really so planted in imitation of the ancient Mediterranean practice of planting cypresses and other evergreens in cemeteries as a symbol of immortality.

Chapter IX

THE DOMESTICATION OF ANIMALS

THERE are two ways in which animals are kept by man. In one, wild animals are caught and kept in confinement, either for some sacred purpose or for amusement. It is usually difficult to get such animals to breed in captivity, and even when possible is seldom attempted, except in modern menageries. Animal-keeping of this type is very ancient, and we know that lions and monkeys were kept by the Ancient Egyptians and Assyrians.

Such animal-keeping is not, however, what we mean by domestication. In this term we really include two ideas, the first that the animal shall be of some economic value to its owner, and the second that its instincts shall be modified in such a way that it becomes easier to manage and to breed from than an animal which has merely been captured and partly tamed.

The uses to which domestic animals are put are, of course, numerous; they include the production of meat and milk; hides, hair, and wool; transport, by draught, burden, or riding; the killing of game and vermin; and, in the case of the dog, protection from human enemies and wild animals.

We may then define a domestic animal as one which is kept for one of these uses, and which breeds in captivity. Of the animals which are tamed, but not really domesticated, the elephant alone is of economic importance. It is seldom bred in captivity because it takes too long to grow up. Of the true domestic animals the most important are the dog, cat, cow, sheep, goat, horse, ass, camel, reindeer, pig, buffalo, yak, llama, and alpaca.

According to the old theory of stages of culture, and of

the savage as inventor and discoverer, we should expect to find that in every country the domestic animals are derived from the wild animals of that country. In fact, as we shall see, we find nothing of the kind. It is reasonably certain that no wild animal was ever domesticated in Negro Africa, North America, Australia, or any of the Pacific islands and very doubtful whether any wild animal, except perhaps the pig, was ever domesticated in Europe.

Let us take the list given above seriatim. The most widespread of domestic animals is of course the dog, in fact, the only people who seem to have been without it are the Tasmanians and the Andamanese. There are, of course, many types of dog, and it was formerly supposed that they were descended from various species of wolf, fox, jackal, and coyote, and that every savage tribe had domesticated whatever dog-like species was found in its neighbourhood. A comparative study of teeth has shown, however, that the ancestor of the dog—all kinds of dog—must have had teeth like a wolf, and that no dog can possibly be descended from a fox, jackal, or coyote. There is no obvious reason why people should wish to, or be able to, domesticate wolves rather than jackals or foxes. In spite of popular tales, it does not seem that any species of wolf is gregarious, though wolves may sometimes tend to congregate under pressure of hunger. Modern attempts to tame the wolf have failed. It is by no means certain that the ancestor of the dog, although it had wolf-like teeth, was actually a wolf. According to Dahr (cited in *Proc. Prehist. Soc.*, 1937, p. 469) the wolf is too large and too specialized to a carnivorous diet to be the ancestor of the dog, which in Dahr's opinion probably derived from some extinct species resembling the dingo. However this may be, it would seem that the domestication of the dog, far from being the sort of thing that might happen anywhere, can only have been achieved in very exceptional circumstances. The dogs of Oceania

certainly, and those of America almost certainly, are derived from Asia, and the dogs of Europe and Negro Africa are probably derived from Asia or Egypt. 'The facts warrant the conclusion', says Wissler (*Man and Culture*, p. 111), 'that the co-partnership of man and dog began in the heart of the Asiatic continent and was carried to the very ends of the earth by the expansion of the human race.' It is, of course, uncertain whether the original homeland of mankind was in the heart of Asia or elsewhere, so that we cannot be sure whether the domestic dog accompanied or followed man to the ends of the earth. Anyhow there seems to be no doubt that the statement of Wells and Huxley (*Science of Life*, p. 229) that 'the habit of domesticating dogs is ancient and widespread', is fallacious, and that the domestic dog, wherever found, is derived from a single source.

With the domestic cat we are on surer ground. The wild cat, a near relative of the domestic cat, is found over a large part of Europe, including the British Isles, but it has never been tamed. Nor have many similar species found in other parts of the world. The ancestor of the domestic cat is a wild variety from North Africa, which was tamed in Egypt, and diffused thence to Asia and, much later, to Europe. Elsewhere it seems to have been unknown before the Age of Discovery.

Now to the cow:

> 'The important religious significance of cattle in early Babylonia', says Forde (*Habitat, Economy and Society*, p. 457), 'led Hahn to claim that their domestication began entirely for ritual purposes. While there can be no proof of this, since domestic cattle long preceded written records, it is important to realize that until an animal was already domesticated and available in considerable numbers it would be almost impossible to conceive of such secondary economic uses for it as providing milk or drawing ploughs.

Domestication cannot have begun with these later values in view.'

It may be added that cattle had also great religious importance in Ancient Egypt, and that in India and a great part of Africa their economic value is still limited by the religious significance which is attached to them. Where, on the other hand, there is no religious sanction, it is difficult to get people to keep cattle.

'Milking', says Hocart (*The Progress of Man*, p. 111), 'is one of those many arts which seem perfectly obvious to us merely because we have been brought up to the idea. Yet milk has been introduced to the Fijians, and they do not take to it, though urged by Government. For one thing their social organization is quite incompatible with the regular routine of a dairy; and, secondly, they do not care for milk. How much less likely is any people to take to it without the example of others! Could early man have adopted it first for infant feeding when the mother's milk was deficient? But to give cow's milk to babies undiluted is notoriously bad. Then it is not easy to milk a half-wild cow. Even if she can be kept still, she has the power of retaining her milk.'

It should be noted, too, that in the earlier stages the domestication of large animals must impose a heavy strain upon the community. Where there are no enclosed fields—and these are quite a modern device—a considerable escort is needed when the herd goes to pasture, to prevent the animals from straying, and to guard against the attacks of lions or wolves. Half-wild cattle, however, would either have to be kept in stockaded enclosures or, if driven out to pasture, provided with a very large guard. Not only would they be very liable to escape on their own, but they would be easily

stampeded. The amount of organization and labour required would be out of all proportion to the economic benefit, and would be quite beyond the means of any savage group. The cattle of Negro Africa are far tamer than any European cattle, and it is this, and the fact that the natives are brought up to spend almost their whole lives in tending them, which makes the cattle culture of Africa possible.

In any case cattle are not native to Negro Africa. There are two main species, the humped and the humpless, both of which have a wide distribution. The former was certainly brought to Africa from India, while the latter may, or may not, have come from Egypt. 'As between a North-east African and a South-west Asiatic origin of cattle domestication it is impossible on the existing evidence to decide. The important point is that in both areas it follows very quickly on the heels of the first cultivation' (Forde, op. cit., p. 448). In other words, we have every reason to believe that cattle were first domesticated by settled cultivators. The wild ox is a native of Europe as well as of South-west Asia, and may well be the ancestor of our domestic cattle, yet it is very unlikely that the hunters of Stone Age Europe had any hand in its domestication.

The water-buffalo, used as a draught animal in many parts of South and East Asia, is probably of Indian origin. It is a near relative of the African buffalo. This animal is found almost all over Negro Africa, yet the negroes have never tamed it, and there is no evidence that they have ever tried to do so.

Domestic sheep of all breeds differ much less from one another than from any species of wild sheep, which makes it probable that all domestic sheep have a common ancestry. It is uncertain whether the urial was alone concerned in this ancestry, or whether there was a cross between the urial and the mouflon. The former ranges from North-west India to Anatolia, and the latter from Persia to Southern

Europe. It does not appear that either of these animals ever had a much wider range than they now have, so that in any case South-west Asia seems indicated as the original area of the domestication of sheep. It is known that both the early Sumerians and the predynastic Egyptians had sheep, but since the Egyptian sheep had the urial as an ancestor, and the urial is not known ever to have been wild in Egypt, the Sumerians are more likely to have been the first to domesticate the sheep, and the Egyptians may well have got their sheep from Sumeria. It is remarkable, however, that neither in Egypt nor any other part of Africa have the sheep wool, and it seems certain that the sheep with wool was the result of highly specialized selective breeding in South-west Asia, whence, together with emmer wheat, it was introduced into Europe. In early Europe sheep and emmer wheat are always found in association, and both are, according to the best authorities, native to South-west Asia.

> 'The Asiatic and African breeds of domestic goat are generally considered to derive from a single wild species which had formerly a very wide distribution in Southern Europe and Western Asia. . . . It is, however, possible that the dwarf goat of Central and West Africa may be descended from a different and perhaps African ancestor' (Forde, op. cit., p. 452).

African, perhaps, but not Negro African, since no wild species of sheep or goat has been found south of the Sahara.

The domestic ass is descended from the wild ass of North-east Africa, and the wild ass of Asia has never been tamed. Domestic asses appear later than domestic cattle, but they existed in Egypt in late predynastic times, and in Sumeria about 3000 B.C. In both countries they were used for milking and draught long before they were used for riding.

The ancestor of the domestic horse is Przewalski's Horse, a native of Mongolia, where it is still found wild. It seems to have been introduced into Mesopotamia, probably from Persia, as early as 3000 B.C., but later than the ass, since it is alluded to as 'the ass of the mountains'. Horses seem to have been herded for meat and milk before they were used for draught. Early representations of what may be horses with riders are found, but there is no doubt that the horse, like the ass, was used for draught long before it was used for riding. Horses were introduced into Egypt about 2000 B.C., and into Europe about a thousand years later. It was not till well on in the second millennium B.C. that cavalry became of any importance, long after chariots were in common use. To make a chariot and harness a horse to it is obviously a more complex process than simply jumping on to a horse's back, but nevertheless it is much earlier. This shows how fallacious it is to base theories of invention upon the belief that what seems simple to us must have come first.

The more important species of camel is the one-humped camel or dromedary. As a wild animal it has long been extinct, and its homeland is unknown, but its area of domestication was probably Arabia or Egypt. The two-humped or Bactrian camel is less important and, as a domestic animal, probably less ancient. It is still found wild in Chinese Turkestan.

The domestication of reindeer seems to have been late, and to have taken place in North-east Asia. As milk producers reindeer have been adopted as a substitute for cattle, and as draught animals as an improvement on the dog. The Eskimo seem never to have attempted the domestication of the reindeer or caribou, though they have taken to the reindeer when it was introduced to them.

The earliest domestic pigs of Europe, found before 2000 B.C., seem not to be descended from the European

wild pig, but to have been introduced from South-west Asia or Egypt, where they are found much earlier. Later, however, the people of Central Europe seem to have succeeded in domesticating the European wild pig. The wild pig of Indo-China and Indonesia is said to be easily tamed, but has never been domesticated; all the domesticated pigs of this area and of Polynesia are descended from the Indian species. Domestic pigs are found early in China, but seem to have been introduced from Persia and not domesticated locally.

The llama and alpaca were domesticated only in the area of the Inca civilization in the Central Andes. A very limited use was made of them.

The available evidence, then, gives no ground for the popular belief that mankind develops naturally from a hunting to a pastoral stage, or that the savage is led by instinct or genius to domesticate animals. The evidence suggests that all the important animals were first domesticated, and all the uses of domestic animals first discovered, in the areas of the early civilizations, Egypt, Mesopotamia, Persia, and India, probably after the beginnings of agriculture in those countries. The only exceptions to this are the dog, whose original area of domestication may have been in East or Central Asia, and the use of the horse for riding, which may have started in Central Asia. Whether the horse was originally domesticated by people with no previous knowledge of domestic animals 'is much more doubtful, and is on general grounds highly improbable' (Forde, op. cit., p. 456).

Chapter X

THE PLOUGH AND THE HOE

CULTIVATION, apart from the tending of trees, may be divided into two types and three methods. The two types are root cultivation and seed cultivation. In the former a hole is dug or scratched in the ground, a tuber, corm, or bulb is inserted, and the plant can then for the most part be left to look after itself. Seed cultivation is far more elaborate. The ground has first to be cleared of all vegetation, then the surface of the soil has to be broken up, the seed scattered, and, when the plants come up, they must be kept free from weeds and protected from the ravages of animals and birds. The technique is so different that it is unlikely that one was evolved from the other. Root cultivation, being simpler, is probably, though not certainly, the older; there appear to be no data upon which any theories of its origin can be formed.

For seed cultivation we are somewhat better placed. There is little doubt that wheat and barley are the oldest cultivated grasses, and the distribution of the wild plants from which these cereals must have been derived makes it pretty certain that seed cultivation began in South-west Asia. As regards its method of origin, it has been plausibly suggested that it arose from the symbolical broadcasting of the seeds of wild grasses as a means of magically increasing the supply. Such a rite is still performed by certain Australian tribes (A. M. Hocart, *The Progress of Man*, p. 103).

The three methods of cultivation are with the digging-stick, the hoe, and the plough. The digging-stick is merely a stout pointed stick, used by non-cultivators for digging up edible roots, etc., and by both root cultivators and seed cultivators over a vast area, including Polynesia and such

parts of America as have not been Europeanized, as their sole agricultural implement. Sometimes the digging-stick is flattened to the shape of a paddle; this form of implement is apparently confined to Middle America and the Philippine Islands. Another improved type has a foot-rest; digging-sticks of this type were used in Middle America and by the Maoris. In Peru the digging-stick was sometimes given a bronze point.

The hoe as known to-day is a flat piece of iron, attached to a wooden shaft, and used to scrape away grass and similar vegetation, and to disturb the surface of the soil. The blade may be at right angles to the haft ('English hoe') or in prolongation of the haft ('Dutch hoe'). Both types are of course used in Europe, but elsewhere there is never any variation from the traditional type. The 'English' type seems to be universal in West Africa, and the 'Dutch' in East Africa. The hoe probably began as a stone implement in Egypt or Mesopotamia, but stone seems to have been replaced by iron before the hoe spread outside that region, since bronze hoes seem to be unknown, and hoes of other materials seem to be merely a makeshift substitute for iron ones.

> 'It is a remarkable and generally unappreciated fact', says Forde (*H.E.S.*, p. 432), 'that hoes with blades of wood or stone are among the rarest of ethnological specimens, and that outside the area of the iron hoe, the primary agricultural implement among the lower cultivators from Senegal to Indo-China, the digging-stick alone is found.'

The iron hoe is made and used throughout Negro Africa and over a wide area of South-east Asia and Indonesia. In Melanesia, Polynesia, and America nothing that can be properly described as a hoe seems to have been known.

Like many other inventions which from their familiarity seem to us very simple, that of the plough is very difficult to explain satisfactorily. We think of a plough as an implement for turning over the sod, but the more primitive forms of plough do not do this; they merely push through the top layer of soil and make a shallow furrow in it, a furrow which does not correspond to anything which is normally made by any form of hand tool. Derivation from the digging-stick is unlikely, since in the old centres of civilization the digging-stick seems to have been superseded by the hoe before the plough came into use. Harrison says that the plough 'was the result of a discovery that a pick or hoe could be dragged through light soil so as to prepare a seed-bed more rapidly than could be done by pecking up the soil' (*Pres. Add.*, p. 6), but Leser regards such a step as an impossible one, and is inclined to derive the plough from some form of draw-spade, an implement which one man drives into the ground and others pull by means of cords. Such an implement is still used in Korea and elsewhere (*Entstehung und Verbreitung des Pfluges*, p. 551).

Hahn thought that the plough was originally a phallic symbol, and Hocart says that:

> 'Any theory of ploughing must also take into account the ritual that accompanies it, for it is in ritual that the theories are expressed. . . . There is a common custom that the king (who is generally the repository of fertility) must do the first ploughing' (*The Progress of Man*, p. 106).

The ritual by which the king initiates the cultivation is widespread in the Old World, and seems also to have been performed in Peru (Enock, *Secrets of the Pacific*, p. 195). In Peru ploughs were unknown, so that they could not have been the inevitable consequence of such a ritual.

Other theories of the origin of the plough have been put forward, but those cited above should suffice to show that it cannot plausibly be attributed to 'evolution', whatever meaning we may attach to that ill-used word. This conclusion will be strengthened when we realize that the adoption of the plough must everywhere have led to a complete breach with the past.

> 'Among hoe-cultivators', as Childe says (*Man Makes Himself*, p. 107), 'the women generally till the fields, build up and fire the pots, spin and weave; men look after the animals, hunt and fish, clear the plots for cultivation, and act as carpenters.'

This division of labour is completely upset by the introduction of the plough, which throws all the heavy work of agriculture upon the men. This change does not follow from the introduction of the plough by itself, but from the fact that the plough was everywhere, up to quite recent times, drawn only by oxen, and there is an almost universal magico-religious prejudice against the handling of cattle by women. This world-wide association of the plough with the ox suggests that Leser's draw-spade is a degenerate rather than an incipient plough.

Apart from the fact that the plough was unknown in America, even in Peru, where the domesticated llama could well have drawn it, we must note that over a great part of Negro Africa we find seed cultivation, iron tools, and domesticated cattle, but no ploughs. Until recent times the plough had a well-marked frontier, which included Abyssinia and Java, but excluded Negro Africa, Northern Asia, Oceania, and America (Forde, *Habitat, Economy and Society*, p. 5).

Sayce (*Primitive Arts and Crafts*, p. 117) suggests the possibility that the plough was invented independently in Sumatra, Assam, Sweden, and Brittany, but these countries,

before they had the plough, were in contact with areas in which the plough had long been known. In addition to the plough itself, the introduction of corn, iron, and domestic cattle must be taken into account. The distribution of the types of plough, together with the other artefacts associated with these types, makes the independent invention of the plough in these countries at least improbable. The relevant facts are given by Leser (op. cit., pp. 531–69) and may be summarized as follows.

In the simplest form of plough, the plough itself consists of a curved piece of wood with a point at one end and a handle or pair of handles at the other. More or less at right angles to the handle is fixed a straight beam, by means of which the plough is drawn (Fig. 1). Ploughs of this type, though varying in the details of their construction, are still found sporadically over the whole area of the plough, from Sweden to India, and from Morocco to Japan. Its antiquity is shown by its appearance in the Old Kingdom of Egypt, about 3000 B.C. Throughout the greater part of the area mentioned above it has been superseded by improved forms, but it is still used in many of the remoter and less civilized parts of Europe, Asia, and North Africa. Wherever found, it is associated with other archaic traits, such as the practice of taking the plough to the fields on a sledge. This practice was followed in Ancient Egypt, and is still followed in parts of Germany, China, and Siam. Then there is the draw-well with counterpoise, familiar in modern Egypt as the *shadûf*. This was used in Ancient Egypt, Babylon, China, Greece, and Rome. To-day it is found in India and many parts of Europe, often in association with the simple plough. The harrow, however, is unknown in association with the simple plough, the users of which break up the clods with a hoe or rammer. Tools used for this purpose are found in France, the Tyrol, Sicily, Central Asia, India, Tibet, and Bali.

In Ancient Egypt the corn was usually trodden out by

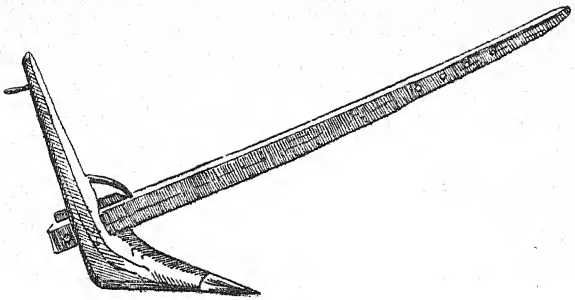


FIG. 1. SIMPLE PLOUGH (TURKESTAN)
(after Leser)

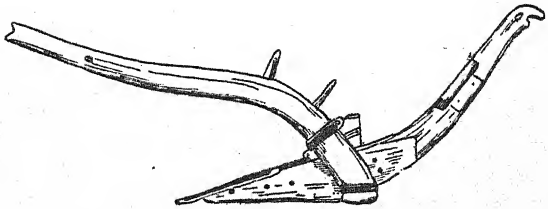


FIG. 2. CURVED-BEAM PLOUGH (GERMANY)
(after Leser)

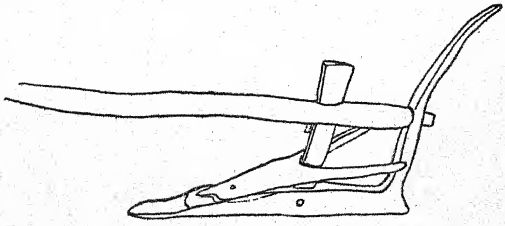


FIG. 3. FOUR-SIDED PLOUGH (MACEDONIA)
(after Leser)

animals, and this method is still used in Central Europe, and over a great part of Asia.

Winnowing in Ancient Egypt was done with a shovel, or sometimes with a winnowing-basket, open on one side. Shovels and winnowing-baskets, exactly like those used in Ancient Egypt, are still used in Northern Europe, Eastern Asia, and elsewhere.

There were two improvements on the simple plough, the curved-beam plough (Fig. 2), and the four-sided plough (Fig. 3). The effect of both these is to give the oxen a straighter pull. The curved-beam plough was known in Babylonia as early as the second millennium B.C. Both these forms have a wide distribution within the area of the simple plough, and with them are everywhere associated the harrow and the flail.

In Leser's view these facts, and many others which he cites, seem to show a connexion between the distribution of the plough and the distribution of the Old-World high cultures, and to prove that the plough did not originate in various places, but in *one* spot, whence it spread over the world.

The modern plough, with iron mould-board joined to the share, was unknown in Europe before the eighteenth century, and is said to have been brought to England from Holland. According to Leser (op. cit., p. 564) it came to Europe from Eastern Asia.

To recapitulate—the digging-stick is so simple and universal that no conclusions as to its origin can be drawn. It may well have been part of the equipment with which our very early ancestors wandered off from their original home.

The hoe is a much later invention. It started as a stone implement in the region of the old high culture, but stone had been superseded by iron before it was diffused to the rest of Europe, Asia, and Africa. It never reached Oceania or America.

The plough is associated with the cultivation of grain, the domestication of cattle, and the working of iron, all of which can be shown to have originated in South-west Asia or Egypt. The simple plough is always found in association with the sledge, the clod-breaker, threshing by treading, the winnowing-shovel or basket, and the draw-well with counterpoise. It is never associated with the harrow or flail, but these latter are always associated with the improved forms of plough.

These facts are incompatible with the usual theories of independent invention, but suggest an elaborate agricultural complex, with later improvements, diffused from some part of the area of the old high cultures.

Chapter XI

POTTERY

THE development of pottery may be considered under five headings:

(1) The discovery that useful and durable vessels can be made of baked clay.

(2) The discovery that pots can be coloured, and that colour will stand fire.

(3) The invention of the potter's wheel, which enormously increased the potter's output, and the fineness of his wares.

(4) The discovery of glaze, which makes pots better adapted for holding liquids and greatly increases the possibilities of ornament.

(5) The development of porcelain, which enabled pottery to be made of a fineness and beauty previously impossible.

The most important and difficult problem is, of course, the first, and I shall therefore postpone it until I have tried to set out what is to be learnt of the other four.

THE PAINTING OF POTTERY

'At the very dawn of the food-producing era the outlines of a mysterious civilization are beginning to emerge. . . . It appears from the Yellow Sea to the Adriatic. . . . The distinctive trait which holds it together is the art of vase-painting. . . . The reader may think that vase-painting is but a slender thread upon which to hang

far-reaching historical conclusions. But consider a moment what that art implies. To paint your clay with a permanent indelible colour that will not be destroyed but fixed by firing, that was a technique the secrets of which are not likely to have been discovered twice' (V. G. Childe, *The Aryans*, p. 103).

In America painted pottery extended from the southern states of the United States to the north of the Argentine. Outside this area, from Canada to Patagonia, was an area in which pottery was unpainted, but was decorated with stamps (C. Wissler, *Man and Culture*, p. 149). Stamped pottery is found also in many parts of the Old World, particularly throughout Negro Africa, where painted pottery is unknown. These facts suggest a diffusion of the art of painting pottery from somewhere in Asia to Europe on the one side and Central America on the other. This suggestion will become more plausible as we go on.

THE POTTER'S WHEEL

'Many users of the wheel know not glaze,' says Hocart (*The Progress of Man*, p. 121),'but none ignorant of the wheel are acquainted with glaze. The conclusion is that glaze is later than the wheel.' This statement requires, as we shall see, some slight modification. Nevertheless the potter's wheel is undoubtedly more widespread than glaze, so we shall consider it first.

'The utilization of the potter's wheel', says Laufer (*The Beginnings of Porcelain in China*, p. 150), 'is restricted to a well-defined geographical area. It occurs only in the Old World, and belongs to Ancient Egypt, the Mediterranean and West-Asiatic civilizations, Iran, India, and China and her dependencies. It is germane to the higher

stages of culture only, and is conspicuously lacking among all primitive tribes. In aboriginal American pottery the wheel was never employed. . . . It is worthy of note that the distribution of the wheel over the area mentioned has remained almost stationary for millennia, and that primitive tribes are not susceptible to adopting it, even if surrounded by civilized people who make use of it' (ibid., p. 151).

The potter's wheel is not merely restricted to a limited geographical area, and to those peoples resident within it who have reached a fairly high standard of civilization, but its use is distinctive in other ways.

'While ethnologists have clearly recognized', says Laufer (ibid., pp. 152–4), 'that the pottery-making of primitive peoples is essentially a woman's occupation, it has not yet been sufficiently emphasized that the wheel is the . . . creation of man, and therefore is an independent act of invention which was not evolved from any contrivance utilized during the period of hand-made ceramic ware. The two processes have grown out of two radically distinct spheres of human activity. . . . All efforts, accordingly, which view the subject solely from the technological angle, and try to derive the wheel from previous devices of the female potter, are futile and misleading.'

Wherever the potter's wheel is found, there the cart-wheel is also found, though their first appearance is not always simultaneous. It is scarcely credible, according to Childe (*Man Makes Himself*, p. 141), that the two primary uses of the wheel arose independently. 'In hither Asia, indeed, wheel-made pots are certainly as old as wheeled vehicles', but in Egypt the potter's wheel was adopted before the wheeled car, whereas in Crete 'models of wagons are a

couple of centuries older than the earliest wheel-turned pots'.

There is no general agreement as to how the wheel began. According to Neuburger (A. Neuburger, *The Technical Arts of the Ancients*, p. 210), 'it is certain that the round log, originally applied to use rolling friction, which facilitates transport, gave rise to the wheel', but this is in fact far from certain. Hahn held that the original wheeled chariot was a priestly model of the sun, moon, and stars, and Laufer holds that the wheeled chariot was used for religious worship before it was used for transportation, and notes that in Egypt, Palestine, India, and China the potter's wheel is associated with the activities of the Creator God. It is also everywhere associated with bronze-casting, and with the adoption of the plough, used entirely by men, in place of the hoe, used chiefly by women (Laufer, op. cit., pp. 158–9).

Where was the potter's wheel invented? According to Laufer (p. 175) we can clearly observe its diffusion from two centres, from Egypt to Europe, and from China to Japan, Korea, Annam, and Burma. It is known to have been introduced into Java and Sumatra, perhaps from India. This leaves us with Egypt, Mesopotamia, Persia, India, and China, in all of which the potter's wheel is very ancient.

Harrison (*Pots and Pans*, p. 38) says that:

> 'We may not go far wrong if we date the invention of the potter's wheel to about 4000 B.C., and if we suggest, as the place of origin, somewhere within range of the ancient civilizations of Egypt and Mesopotamia, a region which appears to have seen the beginning of the potter's art itself. . . . To the Egyptians it was known apparently as early as 3500 B.C.'

But the probability is, as we have seen, that the potter's wheel was evolved with, or from, the chariot wheel, and the

Egyptians do not seem to have had wheeled vehicles till after 2000 B.C. (H. R. Hall, *Greece in the Bronze Age*, p. 85). It is unlikely then to have been invented in Egypt, and Hall is of the opinion that 'its invention may plausibly be assigned to the Elamites, as pottery made with it is found in Elam, at Susa, at least as early as the beginning of the fourth millennium B.C.' (p. 72), and that 'it was in Babylonia, or more probably in the hills of Elam, that the wheeled cart was invented, and to the Aegean this invention probably came through Asia Minor, as eastward it passed to India' (p. 84). Of this we cannot be sure, but all the evidence leads us to agree with Laufer (op. cit., p. 175) that:

> 'It is inconceivable that the wheels of India should be independent of those of the West. The social setting of the wheel and the concomitant culture elements have been characterized above. The wheeled cart, the highly developed system of agriculture, bronze-casting, and the affiliation of pottery with the latter, are features peculiar to the same area, and absent in other culture zones. Consequently the presence of the wheel in East and West alike cannot be attributed to an accident, but it appears as an organic constituent and ancient heritage in the life of the Mediterranean and great Asiatic civilizations. This well-defined geographical distribution, and the absence of the wheel in all other parts of the globe, speak well in favour of the monistic origin of the device.'

The available evidence, then, has driven the leading students of the question to the conclusion that the potter's wheel was evolved in, and diffused from, some area between the Nile and the Pacific, not far from the thirtieth parallel of northern latitude. There are reasons for thinking that this area may have been that important centre of early civilization which lies above the head of the Persian Gulf.

GLAZING

Glazing consists in treating the surface of a pot in such a way that when the pot is fired it emerges with a glassy surface. The earliest known form of glaze is found in Egypt in very early times. This was an alkaline glaze which could be coloured blue or green with copper. It could not be applied to clay, but only to a porous paste of silica, and therefore, though it was used extensively for beads, small figures, and tiles, it could not be used except to a very limited extent for pots (Harrison, op. cit., p. 52; W. F. Petrie, *Arts and Crafts of Ancient Egypt*, p. 107). The first satisfactory surface glaze for use in pottery was what is called a lead glaze, known in Mesopotamia at least as early as 600 B.C. The glaze was produced by sprinkling the upper part of the pot with powdered lead ore, the lead of which combined in the fire with the silica and alumina in the clay to form a coating of glass. A knowledge of this glaze was transmitted to the West by the Romans, and later by the Arabs, and the glaze was used in England till the eighteenth century (Harrison, op. cit., p. 53).

> 'I cannot think', says Mackay (in *Mohenjodaro*, vol. ii, p. 580), 'that faience was invented independently both in Mesopotamia and Egypt. Its manufacture is a somewhat elaborate process and requires great attention to detail, first in the preparation of the glaze, then in its application, and finally in firing it in a muffle or kiln. Taking all this into consideration, it seems much more probable that the craft originated somewhere in the Middle East and then gradually spread over the ancient world.' ('Faience' is a general term for glazed pottery.)

The process of glazing pottery was unknown in China till about the second century B.C., when it was introduced

from the West, and it appears that for several centuries the Chinese continued to import from the West the materials for making glaze. They were, however, experimenting, and about the third century of our era succeeded in discovering how to make a porcelain glaze from a feldspathic rock known to us as petuntse (Laufer, op. cit., pp. 110, 138, 176).

The principle of glaze was not understood in the New World, yet Wissler (*Man and Culture*, p. 71) tells us that in the Pueblo area a true glaze was used for decoration. It seems impossible to explain this fact except on the supposition that the art of glazing was introduced from across the Pacific, but failed to establish itself.

The only important glaze other than lead glaze and porcelain glaze is salt glaze. This was introduced into England from Germany, where it was known at least as early as the fourteenth century (Harrison, op. cit., p. 54).

> 'We may note,' says Harrison (ibid.), 'that neither lead glaze, nor porcelain glaze, nor salt glaze, was independently invented by the English potters. Nor, with the probable exception of the last-named (which, incidentally, does not appear to have been known to the ancients), were they discovered in Europe. In each case—and the same is true of enamels—the knowledge was passed on, and the evidence suggests that there was only one effective discovery in each case.'

PORCELAIN

> 'Porcelain is not an "invention" that can be attributed to the efforts of an individual; but it was a slow and gradual process of finding, groping, and experimenting, the outcome of the united exertions of several centuries' (Laufer, op. cit., p. 99).

Porcelain consists essentially of the firing together of

kaolin or china clay and petuntse, both of which substances are found in many parts of the world. Kaolin has been used by potters outside China, but without producing any porcelain-like product. Many clays contain kaolinite, and the use of kaolin was not a discovery, but rests on experience. It was incidentally found, and its use extended, through a selective process in the enrolment of materials. This process took place in China alone. Ware of a porcelain-like character first appears there in the third century of our era, and experiments were continued till about the beginning of the seventh century they gradually resulted in the production of a true white porcelain (ibid., pp. 110, 120, 176).

Some Chinese porcelain is said to have been presented to Lorenzo de' Medici by the Sultan of Egypt in 1487, and this seems to have been its first appearance in Europe. It was not successfully imitated till the eighteenth century.

THE INVENTION OF POTTERY

We have seen that the principal improvements in the potter's art, the use of paint, of glaze, and of the wheel, and the making of porcelain, were made by civilized people living within a limited region, and furthermore that we can with either certainty or probability allot these improvements to some area within that region, whence they were diffused. There are, it is true, other improvements, such as the use of 'slip', a surface dressing of finer material, which took place so long before the dawn of history that their origin is unknown. In this case, as in others, it is difficult to believe that the unknown happened quite differently from the known, and that this too was not a discovery made at some centre of civilization.

And now to the actual invention or discovery of pottery; was it really, as is commonly supposed, made independently by thousands of savages in various parts of the world?

Before attempting to answer this question, we must ask two others, first, is the art of making pottery an easy thing to discover? and secondly, have all savages made this discovery? The first question we can confidently answer in the negative. None of the tribes which use pottery but do not make it—and there are many which habitually acquire it by trade from neighbouring tribes—has been known to find out how it is made. If pottery-making were easy to discover, it should be still easier to imitate. Not only has nobody ever been known to discover the art of pottery-making, but nobody has succeeded in putting forward a convincing theory of how pottery-making could have been discovered. If it were really easy for savages to discover the art, it should be easy for scientists to imagine how they could do it.

Harrison (op. cit., p. 20) dilates upon the large number of steps which had to be taken before clay could be turned into pots. The idea of a vessel to hold food and water could be derived from a shell, a gourd, or a coco-nut, but the mere discovery that fire sometimes turned wet clay into a hard substance would not put the savage in the way of making earthenware pots and using them instead of more natural vessels. Harrison suggests (p. 24) that:

> 'The first unconscious step in the direction of pottery-making may have been the plastering of clay upon the surface of wind-screens of wicker or wattle, to stop up crevices. . . . It may also be that observation of the water-holding power of depressions in clay—or even merely observation of the plasticity of clay—led to its use to turn a leaky basket into a water-pot. The chance burning of such a wind-screen or basket may have led to the discovery that the clay remained behind, no longer as clay but as something other.'

Childe (*Man Makes Himself*, p. 104) tells us that 'the potter's craft, even in its crudest form . . . involved an

appreciation of a number of distinct processes, the application of a whole constellation of discoveries'. He also inclines to the theory that pottery-making 'might have originated in the accidental burning of a basket plastered with clay to make it water-tight' (p. 101).

Nordenskiold (*J.R.A.I.*, 1929, p. 287) regards this theory as 'simply preposterous', and says that there would have been no other result than a rubble of burnt clay. His suggestion is as follows—in many parts of the world people who have no pots which can be put on the fire cook by dropping red-hot stones into gourds or water-tight baskets. In parts of America where stone is scarce are found large numbers of clay balls which were apparently used instead of stones for boiling. He suggests that the beginnings of pottery may have been in the moulding of these balls.

Dixon (*The Building of Cultures*, p. 162) has another theory, based on

> 'the fact that numerous examples have been found, at very early sites (in the south-west of the U.S.A.) of pots moulded in baskets, by lining the latter with clay and then, after drying, removing it from the basket. This method of making unfired pottery has often been suggested as likely to have been the way in which pottery was invented'.

But what could have been the next step? Why should any one put such vessels very carefully into the middle of a hot fire? A pot is a vessel of fired clay, but Nordenskiold's fired clay is not a vessel, and Dixon's vessel is not fired. The more the problem is considered the more difficult its solution appears, and the more unlikely it becomes that the discovery was made independently by primitive savages in many parts of the world.

And this brings us to the second question we asked above: how far is pottery-making universal? The answer is that

it is by no means so. In Asia it is unknown to many tribes of Siberia, Indo-China, and the Himalayas. In Africa it was unknown in the extreme south. It is unknown to the Australian blacks, the Polynesians, some of the Melanesians, and the Negritoes of the Philippines. In America it is unknown in the extreme south, and over a great part of the north, though the Eskimos, unlike the neighbouring Red Indians, are potters (Laufer, op. cit., p. 149). Wissler (op. cit., p. 68) notes 'a rather close agreement' between the distribution of pottery and maize in North America, and supposes that both came by the same road from the south.

Old as pottery is in Europe, it is not a European discovery.

> 'The potter's art', says Peake (*Early Steps in Human Progress*, p. 163), 'seems to have been introduced into Spain from Greece about 2400 B.C. with the knowledge of agriculture, and from the Peninsula both arts were rapidly carried over the whole of West Europe.'

In Thessaly pottery goes back at least to 3000 B.C., and there the people, though they seem to have been ignorant of metal, made their pots in imitation of metal vessels with rivets (ibid.).

If to discover the art of pottery-making comes naturally to savages, it is strange that so many peoples are still unacquainted with it, and that so many others are known to have received it from the outside. And if, as we saw above (p. 31), many Polynesians and Melanesians once made pottery but do so no longer, then the improbability of its independent discovery is increased. We can hardly suppose that they went through all the processes necessary for the development of the art, and then proceeded to forget them. They are far more likely to have forgotten an art which they had acquired through temporary contact with more civilized people.

Pottery is so widespread and so familiar that we are apt to forget that it is merely a luxury. Many savages manage very well without it, and our own Saxon and Norman ancestors made little use of it, using instead vessels of wood, leather, or horn. The uses of pottery vary greatly. We use it chiefly for serving food and drink, but savages use gourds or horns for this purpose, and use their pots for cooking, milking, and carrying water. Yet not merely are the forms of pot everywhere much the same, but so are its decoration. The swastica pattern, for example, is found on pots, mostly of a primitive type, from various areas in five continents.

Many of the earliest pottery objects are not vessels, but beads and figurines, and it is possible that the potter's art was originally developed as a means of making such objects, and that the original pots were imitations of bronze vessels.

As we noted above, among savages who do not know the wheel, the making of pottery is almost entirely confined to women. This has led many writers to conclude that the art must have been discovered by women, but this by no means follows. The sewing-machine, the electric iron, and the vacuum cleaner are used almost entirely by women, but they were not invented by women. It is, as Havelock Ellis says (*Man and Woman*, p. 408), men, not women, who invent labour-saving devices for the home. It would seem that a magico-religious dogma confines pre-wheel pottery to women, just as a similar dogma confined pre-plough agriculture to women. This fact, if fact it is, affords another argument for the view that pottery formed part of the great corn-growing complex which was diffused from the Near or Middle East at the dawn of the food-producing era, perhaps in the fifth millennium B.C.

Anyhow, we are pretty safe in concluding with Harrison (op. cit., p. 26) that it is probable that

'the discoveries leading to the shaping and firing into

earthenware vessels were successfully strung together in one region and at one period only, at such a period in the history of man that the knowledge of the new craft was carried over practically the whole of the Old and New Worlds.'

Chapter XII

THE OUTRIGGER CANOE

THE outrigger canoe, in its simpler forms, is a dug-out canoe with two light poles fastened across the gunwales; to the ends of these poles, on one or both sides, are fastened wooden floats. The effect of these floats is to prevent the canoe from capsizing, and in particular to enable it to be used with sail.

> 'Two hypotheses', says Dr. Haddon (*J.R.A.I.*, 1920, p. 121) 'are current concerning the origin of the outrigger: (1) That it is derived from a double canoe, one of the canoes having degenerated into the float of the outrigger. In double canoes one is often smaller than the other, and in some places the smaller canoe bears the same name as the float. . . . (2) That the canoe was evolved from the central log of a float or raft, the two outermost logs of which have persisted as the floats of a double outrigger.'

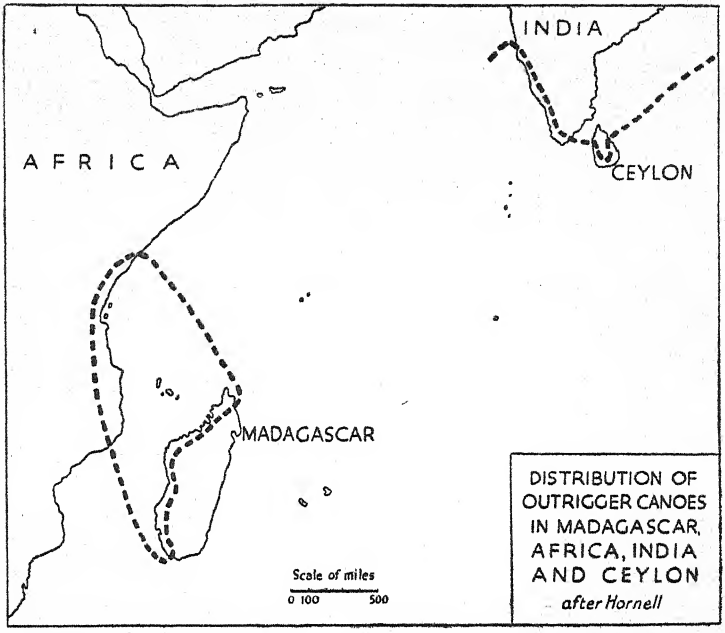
He goes on to say that the first hypothesis would make the single outrigger come before the double, while the second would reverse them.

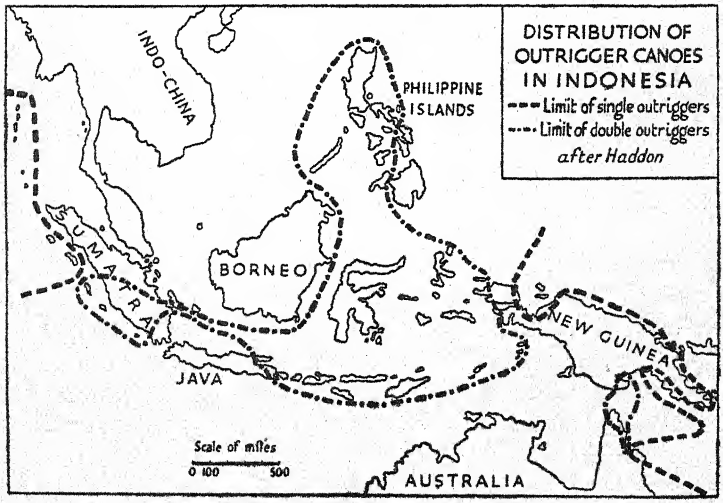
It is difficult to see why any one should start to hollow out the central log of a raft; in fact it is difficult to imagine how any one could have thought of making any kind of boat by hollowing out a log. It is quite possible that the first step in navigation was to sit astride a floating log and paddle with the hands, and it is commonly supposed that from this to the dug-out canoe would be a simple step. But far from being simple, it is in fact impossible. A dug-out canoe is a complex artefact requiring a great deal of hard work to make,

and considerable skill to navigate; between it, in its finished form, and a simple log, there is no intermediate step whatever. While a dug-out canoe is difficult enough to navigate, a half-dug-out canoe would be quite impossible. The next step from a single floating log might be to fasten two logs together, but this would lead not towards but away from the dug-out canoe. The tendency of those who use rafts is not to make holes in the logs of which the raft is composed, but to fasten as stable a platform as possible to the top of them. It is highly improbable that any one ever thought of hollowing out a log experimentally to see whether it could be used for navigation, and it is possible that the dug-out canoe arose from the accidental discovery that a log hollowed out for some other purpose, a coffin, a drum, or a food store, could be used as a boat. The three first-mentioned could be derived by a process of gradual development from a practice of utilizing hollow trees, but no such gradual development is possible for the canoe.

Another possibility is that the dug-out canoe was an imitation of a plank-built boat made by people who had not the skill to build the latter. The outrigger is now found chiefly attached to dug-outs, but it is to be noted that the outrigger vessels of Java, by means of which, as we shall see, the knowledge of the outrigger was diffused to Africa and perhaps elsewhere, were and still are quite large plank-built boats (J. Hornell, *J.R.A.I.*, 1934, p. 332).

However this may be, it seems likely that the first hypothesis mentioned by Dr. Haddon is the correct one (General Pitt-Rivers inclined to this view: *J.R.A.I.*, iv, p. 427), and that the outrigger is derived from the double canoe. Here we have an easily conceivable line of advance. Two canoes put out side by side, and a man in one steadies himself by grasping the gunwale of the other. If this became a regular practice, then sooner or later the idea might arise of replacing the human arm by a piece of wood. The result would be a


INDIA
AFRICA
CEYLON
MADAGASCAR
Scale of miles
0 100 500
DISTRIBUTION OF OUTRIGGER CANOES IN MADAGASCAR, AFRICA, INDIA AND CEYLON
after Hornell


INDO-CHINA
PHILIPPINE ISLANDS
BORNEO
SUMATRA
JAVA
NEW GUINEA
AUSTRALIA
Scale of miles
0 100 500
DISTRIBUTION OF OUTRIGGER CANOES IN INDONESIA
Limit of single outriggers
Limit of double outriggers
after Haddon

double canoe, and if at times one part only of the double canoe were used, then the way to the outrigger would be open. Of course, this is guesswork, but it follows the lines on which the inventions whose history is known have progressed, that is to say, step by step, and not by sudden jumps.

If some such explanation as this is correct, then it would follow that the single outrigger is older than the double, and that is what the distribution of the two suggests. The outrigger is found in Southern India and Ceylon, Indonesia, and almost all the Pacific islands, as well as in Northern Queensland, with an outlying area in Madagascar and East Africa. The double outrigger is found only in this latter area, in Indonesia, and in a small area in South New Guinea and Northern Queensland. Within these areas the single outrigger is also known, and the evidence suggests that the double outrigger was an Indonesian invention which was diffused, and adopted where it was found to be useful.

So far as I can learn, every one who has studied the subject has come to the conclusion that the outrigger was diffused from a single source. The reasons for this conclusion are:

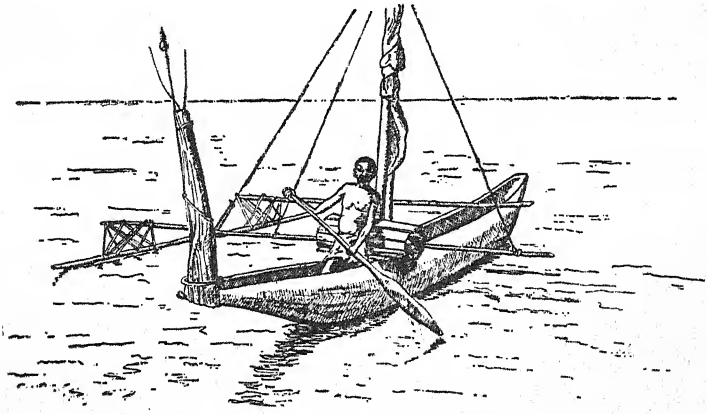
(1) It has never, so far as is known, been used outside the Pacific and Indian Oceans.

(2) The whole of its area has linguistic and cultural resemblances which link it with Indonesia, and much of it is known to have been visited by sailors from Java and Sumatra in outrigger vessels.

(3) There are many resemblances, both in principle and in detail, between the outriggers of widely separated areas, and in parts of Polynesia, Melanesia, and Queensland the outrigger is called by the same, or nearly the same, name. (A. C. Haddon, in *Essays presented to W. Ridgeway*, p. 629; J. Hornell, in *J.R.A.I.*, 1934, p. 320; *Canoes of Oceania*, by these two writers, and their other works on this subject.)

There are many reasons for believing that the Polynesians, who reached Hawaii, Easter Island, and New Zealand in their outrigger canoes, came from Indonesia or South-east Asia, and it is known that they have largely influenced Melanesia.

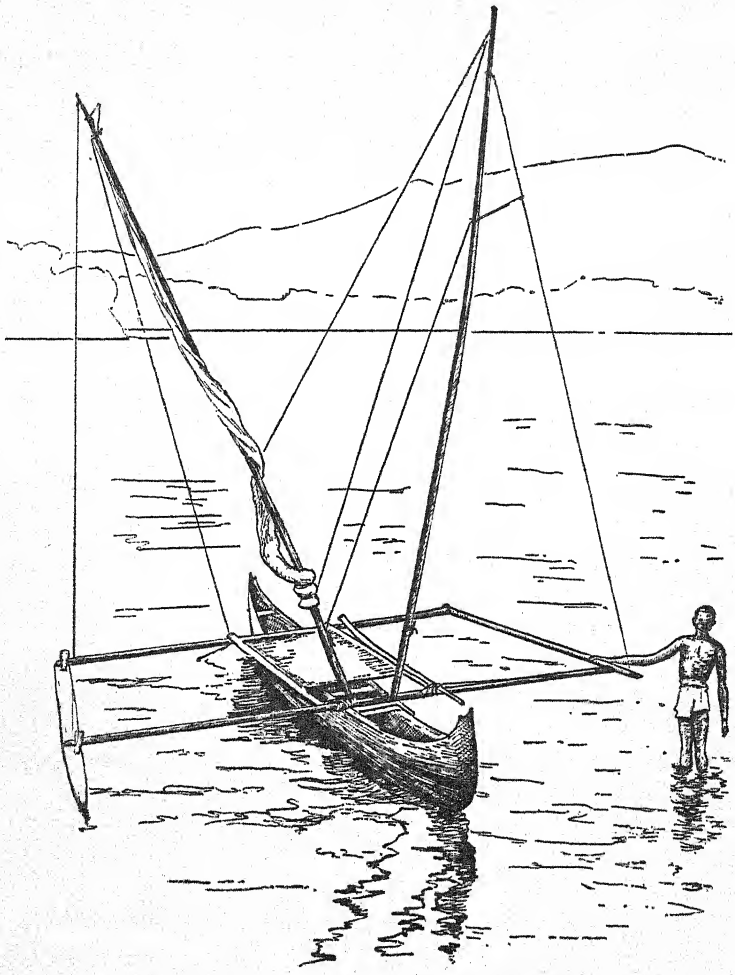
It was Indian influences which led to the great civilizations of Sumatra and Java which flourished at the beginning of our



OUTRIGGER CANOE, FLY RIVER, NEW GUINEA
(*after Haddon. From a photo by G. Landtmann*)

era, and outrigger vessels from these islands had a regular trade, not only with China and the Pacific, but with Madagascar and East Africa. So close was their contact with Madagascar that the people of that island, though of negro race, speak an Indonesian language.

Since the civilization of India is older than that of Sumatra and Java, and the outrigger is still used in India, the probability is that India is its original home. This applies to the single outrigger only. The double outrigger is not found in India or Ceylon, so is probably an Indonesian invention, or rather improvement. It is impossible to be sure on this point, however, since in India, Ceylon, and Indonesia the



SAKALAVA OUTRIGGER CANOE, MADAGASCAR
(*after Hornell*)

outrigger vessel has for centuries been in a state of gradual retirement before sea-going vessels of more European type.

Some people who once had the outrigger canoe have lost it. Dr. Rivers (Westermarck's *Festkrift*, pp. 109–12) gives two examples. The Torres Islands lie between Santa Cruz and the Banks Islands, in both of which outrigger canoes are made and used, yet the Torres islanders have nothing in which to cross from one island to another except rude bamboo rafts. It seems that they simply allowed their canoe-makers to die out.

In Mangareva (Gambier Islands) the people sail about in large rafts, but the name by which they know these rafts is that applied by many other islanders to the outriggers of their canoes. It is thus possible that the raft is not an independent invention, but merely a degenerate outrigger canoe.

On the coasts of Columbia and Chili are to be found canoes not with regular outriggers, but with a balance log lashed outboard on each side. Mr. Hornell (*Man*, 1928, p. 102), after considering the alternatives of independent invention and introduction from Polynesia, decides against both, and thinks that the device was probably introduced by the Spaniards from Manilla, where a similar device is in common use.

The primitiveness of South American boats has been used as an argument that culture could not have been brought to them across the Pacific, but Rivers (op. cit., p. 127) shows that since people who have plenty of timber and are always on the water can be shown to have lost the art of making canoes, this argument is invalid. It is to be remembered that our Anglo-Saxon ancestors had in the course of two or three centuries completely lost the art of navigation, in which they had been experts. King Alfred had to bring in foreigners to build and man his navy.

In the outrigger we have a simple and useful device, which has enabled small vessels to sail thousands of miles across

the open sea, yet such seafaring peoples as the Phoenicians, Greeks, and Norsemen never thought of it, and all our evidence goes to show that it was evolved in one area, and thence diffused across the Pacific and the Indian Oceans. It is now in retirement before more modern types of vessel. In a hundred years time it will probably be confined to odd corners of Melanesia and East Africa, and the multiple inventionists, if any survive, will conclude from the difficulty of communication that it must have been evolved independently in those two areas.

Chapter XIII

THE CAST-NET

THE cast-net is a device used for catching fish, prawns, and shrimps, and, in Portugal, quails. It varies considerably in size, but typically consists of a circular net about fifteen feet in diameter. Lead weights are fixed all round the circumference, and a cord is attached to the centre. A common mode of use is to fold the net over the left shoulder, with the weights hanging level near the ground. The cord ends in a loop, which is put round the right wrist. The operator takes a fold of the net in his right hand, and stands upright. Then, keeping his arms stiff, he gives his body a sharp twist from left to right, pivoting on his right foot, and at the same time lets go. If properly cast, the net drops on to the water in a perfect circle. The operator waits for a few seconds, till the net has settled on the bottom, and then pulls slowly in. There are minor variations from this method, such as casting from the right shoulder instead of the left, or taking a fold of the net between the teeth.

There are four known types of net. In the simplest, the weights are fixed all round at the actual edge of the net. In a commoner type, the margin is turned in a few inches all round so as to make a pocket, the weights being affixed at the points at which the turned-in part is tied. The effect of this is that the fish gets its head into the pocket instead of escaping under the net. In a third type the cord, instead of being fixed to the centre of the net, passes through a ring, and is then joined to a number of small cords attached to the circumference. The result is that when the net is pulled in, the edge of the net is drawn up to the centre, forming a deep pocket all the way round. In a fourth type,

which seems to be found only in the Crimea, the cord, instead of going to or through the centre of the net, is threaded round the circumference. The result is that the net, when pulled in, is drawn into the shape of a purse.

In many cases in which the use of the cast-net is recorded there is no description of the net, so that it is impossible to plot the distribution of the several types with any great accuracy. It seems, however, that the first and simplest type is confined to inland and out-of-the-way regions, while the second type, that with the marginal pockets, has a general distribution over the whole area within which the cast-net is known, including that of the third type, that with the central ring. This latter type seems to be confined to North Africa, Palestine, and parts of Europe, India, and America, but not to be known in Egypt.

The area of the cast-net as a whole includes the whole of Europe except, apparently, North Russia; the whole coast of North Africa; the coast of West Africa from Senegal to Angola, with some extension up the great rivers. It is found in Madagascar and sporadically in East Africa, but in South Africa is altogether absent. In Asia it is found in Palestine and Mesopotamia, India, China, and Japan, and is probably general in South-east Asia, and widespread in Indonesia, Micronesia, and Melanesia. In Polynesia, however, it is rare, and in Australia apparently unknown. In America it is general in the West Indies, and found in many of the eastern states of the U.S.A., especially the coasts of Florida and Texas. In the west, however, it is found only in California. In South America its use seems to be confined to Brazil.

As regards its origin, it seems to be generally agreed that it was introduced to the New World by Europeans, and that its introduction to Polynesia is recent. As regards Africa, in the Gold Coast the god who is the patron of fishing carries a cast-net as a symbol of office. In spite of this Professor Lindblom concludes that it was introduced to

West Africa by Europeans, probably the Portuguese. His reasons are that it is everywhere weighted with imported lead, almost everywhere made of imported yarn, and is almost confined to the coast. As regards East Africa, its very sporadic occurrence, again almost confined to the coast, strongly suggests recent importation.

So far, then, as the cast-net is concerned, the world may be divided into three regions. In the first of these, which includes nearly all of Europe, the whole coast of North Africa, and South and West Asia and Indonesia, the cast-net has existed from time immemorial. In the second region, which includes parts of East and West Africa, parts of America and some of the Pacific islands, the cast-net, though extensively used, is a fairly recent introduction. In the third region, which includes Northern Asia, Central and South Africa, Australia, many of the Pacific islands, and the greater part of America, the cast-net is unknown.

A study of the distribution of its four types suggests that the second is the original. It is certainly the standard, having a general distribution over the whole area within which the cast-net is found. The first type, that in which there is no pocket or bag, is reported from France, Palestine, Jubaland, and Sumatra. It is possibly an earlier type, but it is an ineffective implement, and this fact, together with its distribution, suggests rather that it is simplified or degenerate.

The third is an improved type, though perhaps only so when shrimps, prawns, or very small fish are to be caught. The principle of the fourth type, the Crimean purse-net, is of course the same as that of the common rabbit net, which is spread, though not cast, over the mouth of the burrow. It is very remarkable that this is the only localized variant.

It is possible that the cast-net was invented more than once in the first region described above, that is, roughly speaking, Southern Asia and the basin of the Mediterranean, but the identity of the prevalent type, when so many variations are

conceivable, makes this unlikely. It is also a striking fact that its distribution, apart from recent introductions and allowing for mountainous areas where it would be useless, coincides almost exactly with that of the plough.

The cast-net is a device which can be used effectively wherever there are sandy beaches or muddy streams. It is an invention within the competence of any one who has string, and metal or even bored stones with which to make weights. Yet even if we assume what seems improbable, namely, that it was invented more than once in our first region, we can say with assurance that there are many gifted races, including the Mayas, Polynesians, and Bantus, who have failed to invent it, though as a rule they adopt it readily when it is introduced. It is still unknown in many parts of the world where it could be usefully employed.

The subject has not been fully studied, and there may be inaccuracies in the foregoing, but even allowing for these, the probability emerges that the cast-net, like so many other artefacts, reached its present distribution by a process of slow diffusion from some one centre. We are again forced to recognize that theories of man's naturally inventive genius and of his instinctive response to nature's challenge can be put forward only by those who have not studied the facts.

(For the types of cast-net, and its general distribution, *v.* I. Arwidsson, in *Rig*, Stockholm, 1930, pp. 29 ff., and for the cast-net in Africa *v.* G. Lindblom, in *Riksmuseets Etnografiska Avdelning*, Stockholm, 1933, pp. 28 ff.)

Chapter XIV

THE KITE

It seems to be the general belief that people all over the world, having watched the flight of birds or the behaviour of leaves in the wind, made toys for the amusement of their children by tying a couple of light sticks in the form of a cross, spreading paper or some substitute for it over them, tying a string to the resulting object, and allowing it to float away in the breeze.

Those who suppose this are quite wrong, since kites had, up to a few centuries ago, a very limited distribution, and, far from being toys, were considered by those who flew them to be of the highest religious importance. The area of the kite, before European traders brought it home with them, was China, Japan, Indo-China, Indonesia, and Polynesia. In these lands kite-flying is still seriously practised by adults, and 'in Micronesia kite-flying is practised as a religious function' (N. K. Chadwick, in *J.R.A.I.*, 1931, p. 457).

In Polynesia kites and kite-flying are associated with the gods and mythical heroes, and have many religious and magical associations.

> 'It would seem that the soul or spirit of a person is thought of in the form of a bird. Now there can be no doubt that the kite . . . is the conventional symbol of the bird, and was, moreover, thought of as the external soul or spirit of its owner, and that kite-flying was a means by which men—especially the aged men—got into touch with the spirits or gods of the heavens, and defeated the emissaries of the nether world' (ibid., p. 478).

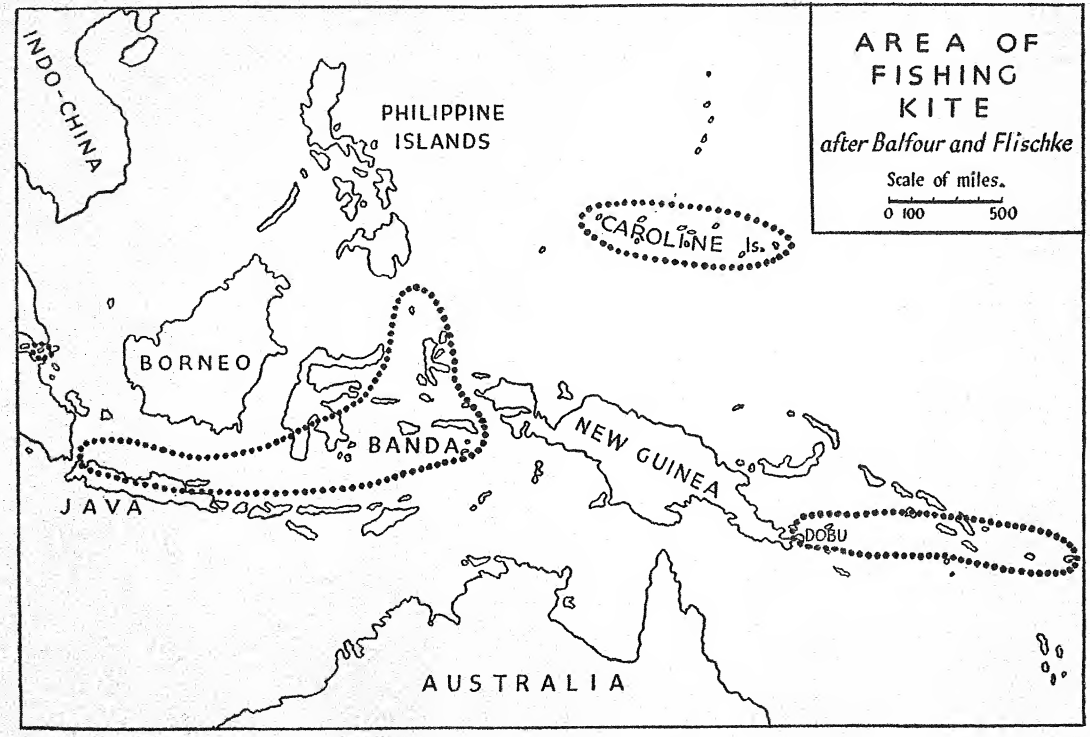
The kite has similar associations in the other regions mentioned above, and Mrs. Chadwick suggests some part of China as the probable centre from which the kite and the cult connected with it were diffused.

> 'A cult which has left so deep an impression on a wide area of the globe may well have arisen in a great centre of civilization, and in association with scientific studies. . . . I think, in fact, that we can watch to-day on the periphery of a circle a ripple which was started in the heart of Asia in the far past' (ibid., p. 489).

We have, then, in the kite, another example of an invention which at the first glance might seem simple and universal, but which on investigation proves to be neither. Since, as we have seen, it was probably diffused from China, it must have been invented by the Chinese, but it is difficult to imagine how the invention could have been made. Mr. Arthur Waley has suggested (*Folk-Lore*, 1936, p. 402) that it developed out of a kind of archery which was peculiar to China.

> 'A great deal of early Chinese fowling was done not with an ordinary bow and arrow, but with a dart, about five inches long, shot from a specially constructed bow. To the dart was attached a long string, which enabled the fowler to draw towards him the prey which he had shot, exactly as one draws in a kite. Surely kite-flying . . . developed out of this kind of archery.'

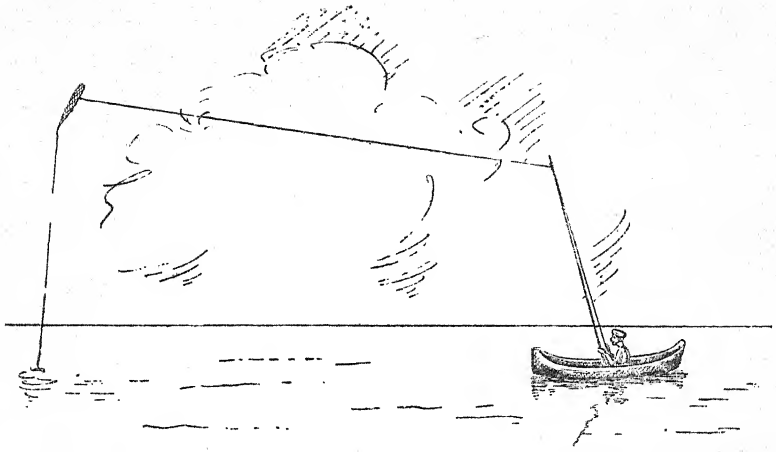
One hesitates to disagree with Mr. Waley, especially on a subject connected with China, but to this theory there seem to me to be two serious objections. The first is that kite-flying consists not in pulling a solid object in, but in starting a flat object from the ground. The second is the religious


AREA OF FISHING KITE
after Balfour and Flischke
Scale of miles.
0 100 500
INDO-CHINA
PHILIPPINE ISLANDS
CAROLINE Is.
BORNEO
BANDA
NEW GUINEA
JAVA
DOBU
AUSTRALIA

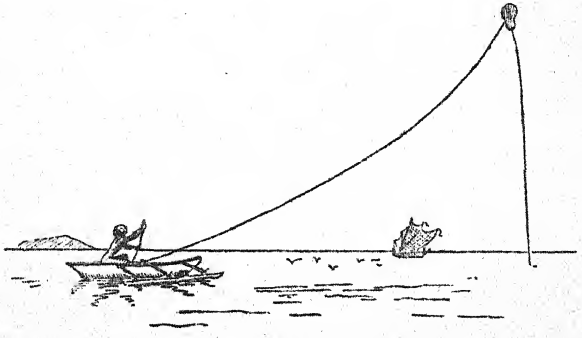
cult of the kite, which has far wider ramifications than those mentioned above, and which could hardly have arisen in connexion with an invention derived from the purely secular occupation of fowling. As an alternative, I should like to suggest the bull-roarer, a flat object which is raised from the ground on a string, and which is extremely sacred. As an argument in support of this suggestion it may be noted that the effect of the bull-roarer is to produce a loud humming noise, and that in Japan, Annam, Cambodia, and Java a musical bow is often attached to the kite to act as a hummer (N. K. Chadwick, loc. cit. pp. 483, 485). Another point to be noted is that the bull-roarer is usually, if not always, taboo to women. In the same way, it appears that throughout the area of the kite cult the kite is never flown by women. We are definitely told that in Japan 'girls never have kites' (ibid., p. 484), and elsewhere, both in myth and in actual practice, the kite seems to be flown exclusively by men.

We may perhaps conclude, then, that in some one area of the ancient Chinese civilization the bull-roarer was developed into the kite, and that the kite, in association with a cult which was partly new and partly old, was diffused to the lands and islands to the east and south.

Throughout the greater part of this area we find that the kite has still religious associations. In others it has degenerated into a mere toy. On the fringe of the area there is, however, a number of islands and parts of islands in which the kite is put to a practical use; it is used for fishing. Professor Balfour published a monograph on the fishing-kite (*Essays presented to W. Ridgeway*, pp. 583 ff.). He tells us that the practice of kite-fishing is confined to two areas. The larger includes the north coast of Java, Southern Celebes, Banda Island, and the Moluccas, with an outlier at Singapore. The smaller includes a number of the smaller islands off the south-east corner of New Guinea, the southern members of the Solomon Islands, and the Islands of Santa



BANDA ISLANDS



DOBU ISLAND

(*after Balfour*)

Cruz (to these H. Flischke, *Leipsic Museum Pub.*, 1922, adds the Caroline Islands). In spite of the gap which divides the two areas, Professor Balfour is of opinion that the practice has been diffused from one centre. His reasons are that the fishing-kite is everywhere used only for catching the gar-fish, and that its methods of construction and employment are everywhere much the same. In particular he points out that the curious cobweb lure, which is employed throughout the eastern area, is also found at Gisser, in the western area. The cobweb lure is made of the web of a particular kind of spider. A quantity of this web is bunched up into a kind of tassel, which resembles a small fish. The gar-fish entangles its teeth in this web, and can then be hauled in. Elsewhere in the western area the usual device is to use a noose of copper wire, with a small fish as bait. This seems to be a recent introduction which has spread to nearly all of the western area, but has not yet reached the eastern.

The kite itself takes various shapes, but is always made of leaves. Professor Balfour concludes his paper with a sketch taken from a newspaper of 1901, showing two English anglers fishing on the south coast with a box-kite. The newspaper describes this as a novelty, but whether the anglers learnt it in the East or invented it independently must remain uncertain. The incidents suggests, however, that though the fishing-kite is confined to these remote islands, it might be useful in other parts of the world.

At any rate the fishing-kite, in actual use, is confined to a limited area, and according to the writer who has studied it most closely, has been diffused from one single centre. The same applies to the religious kite, from which our own toy kite, and later our box-kite, are derived. Advocates of the multiple invention theory can regard the kite with but little satisfaction.

Chapter XV

THE MUMMY

IN the preceding chapters we have seen that of the means whereby man gets his subsistence, and of his tools and appliances, some of the most important and widespread did not have a multiple origin, but originated, in all probability, in some one spot. It should be clear that where tools and appliances come into existence, there also are likely to arise the customs, rites, magical practices, and religious beliefs which are everywhere found in association with them. It should also be clear that if savages never have any new ideas about the food supply, they are unlikely to have new ideas about such less insistent subjects as the fate of the soul after death.

Almost all of those, and they are very many, who have discussed what they call 'primitive religion' have discussed it without regard to the material culture of those whose beliefs they were discussing. If they have thought about the matter at all, which most of them obviously have not, they have tacitly assumed either that every agricultural village in the world has evolved for itself the whole complex of corn, ploughs, plough-oxen, harrows, sickles, flails, winnowing-fans, etc., or, alternatively, that people have borrowed all these traits from outside without having their own customs, rites, and beliefs affected in the slightest degree. Frazer (*G.B.*, vol. vii, p. 58) notes the possibility that corn-growing may have been diffused from Greece to Italy, but the idea does not seem to occur to him that this, if a fact, might explain the similarities between Italian and Greek agricultural ritual. All over Europe we hear of peasant cults, peasant customs, peasant rites, peasant beliefs, and

so on, but what is the history of these peasants? Either they came from the East, or they borrowed from the East the agricultural complex in virtue of which they are peasants and not hunters or food-gatherers. Can it be believed that they brought in or borrowed all the material elements of the agricultural complex, and yet that the rites and beliefs which are found all over the world, with comparatively slight differences, wherever corn is grown, were evolved in each village quite independently? Those who fondly suppose that wheat once grew wild wherever wheat is now cultivated may believe that all the rites connected with wheat-growing are the natural product of the human mind, though these rites are obviously artificial in that they have no real effect upon wheat-growing at all. Once, however, it is realized that cultivated wheat and cultivated barley must have been diffused from the very limited area in which are found wild wheat and wild barley, then agriculture appears not as something which savages progress into naturally, but as a vast complex, not only of processes and appliances, but also of the rites and beliefs with which these processes and appliances are everywhere, or almost everywhere, associated. It must seem at least probable that all these elements of the agricultural complex were diffused together.

A survey of ritual shows that some of its most important and most widespread forms are connected with the cultivation of corn, and since it is possible to carry on the cultivation of corn without ritual, and since we have every reason to believe that corn-growing was diffused from some one area, we are justified in regarding it as at any rate possible that all such ritual was diffused from some one area, that area in which corn-growing was developed.

It is true that there are people, such as the Australian blacks, who have a good deal of what usually forms part of agricultural ritual without having agriculture, but the Australian blacks, in this as in other respects, are exceptional,

and we have seen reason to believe that their culture is really a decadent survival. It is impossible to regard as natural any form of ritual which is not universal, at any rate within the limits of environmental possibility. As I have tried to show, where an artefact which might be made and used anywhere is in fact made and used within a limited area, we may reasonably expect that it has been diffused from some one centre. I shall now try to show that the same applies to rites. The rite that I have selected is that of mummification. I have selected it because it is in itself a sufficiently remarkable rite, and because a mummy is capable of exact definition as a corpse which is treated in such a way as to preserve it, at any rate for a time, from the normal process of decomposition. Mummification cannot, like burial, cremation, or simple exposure, be supposed to be a convenient way of disposing of the dead.

The generally accepted theory of the origin of this custom is that it arose through the observation that bodies buried in sand or dry soil did not decay, but were dried into a form which preserved some resemblance to a human being. According to the theory this discovery led to a belief in immortality, and induced people to attempt the task of preserving the bodies of their deceased relatives, in order that by putting on incorruption they might achieve immortality.

'The real origin of mummification', says Hall (*Hastings' Ency.*, vol. iv, p. 459), 'is to be found in a simple desire to preserve the dead man to his family.' Yet that the true explanation is not so simple as this should be clear not merely from the limited distribution of mummification, but from a fact which Hall mentions on the same page, namely, that in Egypt the dead man 'was venerated as being himself Osiris, not as an ancestor'. If mummification is purely a family affair, why should you regard the mummy of your father as a mythical king? And why should the embalmer impersonate the god Anubis and wear a jackal-headed mask?

Elliot Smith had a similar theory; he supposed (*The Migrations of Early Culture*, p. 35) that the Ancient Egyptians, having discovered that corpses buried in the sand retained to some extent their human form, became obsessed with the idea that bodies should be preserved, and therefore began to bury in tombs, but, learning from tomb robbers that bodies so buried decayed, adopted the practice of mummification to produce artificially the result which the sand had produced naturally. But tomb burial without mummification went on in Egypt for centuries before the introduction of mummification; did they really have to wait all this time to learn from a tomb robber something that every housewife knows? Every mummy was Osiris; was every body dug up out of the sand Osiris? Certainly not; it became Osiris by the ritual of mummification, and not by the mere fact of preservation. As Dr. Harrison says (*Pres. Ad.*, p. 8):

> 'That under certain conditions the body, buried or unburied, did not entirely lose its human semblance, was in itself no inducement to the conservation of the dried remains. A shrunken body was of no more value than a skeleton, and new views of man's place in nature, and in supernature, had to be evolved before the preservation of the body became a means to an end.'

But what end? To render the individual, any or every individual, immortal is the usual theory. This may indeed have been the end during the last period of Ancient Egypt, but it seems impossible that this was how it began. Mummification, wherever it originated, is or was by no means confined to Egypt, but has a well-defined area of distribution. It is, or was, practised in the Canary Islands, sporadically throughout Negro Africa, and in Madagascar; in India, Ceylon, Tibet, and Indo-China; in Indonesia and parts of

Oceania and Australia; and finally in pre-Columbian America, particularly Peru. When we examine what we are told of mummification in these areas, we note three features which appear to be general, except in Ancient Egypt:

(1) Mummification is limited to kings and chiefs.
(2) Mummies are not kept indefinitely, but are burnt or otherwise disposed of at the end of a fixed period.
(3) The disposal of the old king's or chief's mummy coincides with the installation of the new king or chief.

Everywhere throughout this wide area we find one or more of these features; sometimes we find them all and, though our information is often very incomplete, we nowhere find anything inconsistent with them, that is to say, anything to suggest that mummification was anywhere either a general practice, or a family affair.

Starting from the West, we know little of the rites of the extinct Guanches of the Canaries, but are told that among them 'embalming was practised only for the chiefs and for the wealthier classes' (W. R. Dawson, *Proc. R.S. Med.*, p. 837).

For Negro Africa we have a good deal of information; I shall give some samples only.

> 'Among the Jukun (of Nigeria), whose king is or was slain by his successor, the entrails are removed, and the corpse smeared with butter and salt; then it is dried over a slow fire; finally the death is announced to the people, and the slayer of the dead man takes his place, stepping over the corpse in the course of the accession rites.'

At Ida there are four branches of the royal family which provide the king in turn. Each king is mummified, and remains unburied until another king of his own branch

comes to the throne (N. W. Thomas in *Ancient Egypt*, 1921, p. 10).

When the king of Onitsha (Nigeria) died his death was kept a secret, and his body was smeared with tobacco juice and mummified by fumigation. This fumigation went on for from one to four months, that is, until preparations for the funeral had been made and a successor decided upon (C. K. Meek, *Law and Authority in a Nigerian Tribe*, p. 155).

At Una (Tanganyika) the body of the king is anointed with beef-oil, sewn in the skin of a sacrificed ox, and smoked with ceremony till after the next new moon. When the smoking is finished the body is dismembered and placed in a coffin, in which it continues to be smoked till the death of the next king. He is installed as soon as the first smoking is over (W. B. Trupe in *Man*, 1939, p. 21). Mummification is practised elsewhere in Africa, but seems always to be confined to the body of the king or chief. (C. G. Seligman, *Egypt and Negro Africa*, p. 32; H. H. Johnston, *George Grenfell and the Congo*, vol. ii, p. 650.)

Passing to Asia, we find that in India there is much evidence for the former prevalence of a custom of mummifying the body prior to cremation. Miss Levin (*Man*, 1930, p. 30) concludes that the custom probably originated with royalties, and quotes the story of King Dasartha, whose body was preserved in oil till the arrival of his son and heir, who had to light the funeral pyre.

In Kanaka (Orissa) the corpse of the local chief is still preserved in oil, and not cremated till his successor is installed; the throne, they say, must never be empty. The Maghs of Bengal dry and embalm their priests and persons of high social distinction, and keep them for a year, at the end of which the funeral rites are performed. The Kukis of Assam smoke dry the bodies of chiefs and headmen, and keep them for two months, after which they inter them with great respect (W. Crooke in *J.R.A.I.*, 1899, p. 272).

In Tibet it appears that the preservation of the entire body by embalming is confined to the sovereign Grand Lamas of Lhasa and Tashilumpo.

Digressing somewhat, we may note that according to Herodotus the body of the king of the Scythians was embalmed, enclosed in wax, and carried round the tribes before being buried with human sacrifices. It does not appear that any one else was embalmed.

In Burma and Ceylon there are no longer any kings, but persons of especial sacredness are still mummified. Miss Levin (loc. cit., p. 31) described a monk's funeral in Burma. After the body has been elaborately embalmed, it is wrapped in white cloth and covered with a layer of gold leaf. A special building is erected in which the body lies in state till the time for cremation arrives.

In Siam the king's body is not now embalmed, but it is placed in two urns so constructed as to facilitate its drying, which was formerly hastened by pouring mercury down the throat. It must not be cremated for at least a hundred days, and in the meantime is served regularly with meals and honoured even more than in life. The new king sets fire to his predecessor's pyre, and is himself crowned the next day. Such bones as survive the burning are placed in a golden urn, and brought out on special occasions to be honoured by the reigning king (H. Q. Wales, *Siamese State Ceremonies*, pp. 140 ff.).

In Indonesia mummification seems to be confined to chiefs (N. W. Thomas in *Ancient Egypt*, 1921, p. 12; W. J. Perry, *Children of the Sun*, p. 199). Among the Dyaks of Borneo the ritual seems to be similar to that in Siam (R. Hertz in *L'Année Sociologique*, 1905–6, p. 50). In Timor the dead rajah is said not to be dead but sleeping in his house, and his successor cannot be appointed till after the final burial. Owing to the expense of the funeral feast, the interregnum may last for as long as thirty years (ibid., p. 60).

In Melanesia and Polynesia, where mummification occurs sporadically, evidence seems to limit it to chiefs, and the same seems to have been the case among the Ainu of Japan (Perry, loc. cit., citing Rivers; Elliot Smith, *Migrations of Early Culture*, pp. 100, 102; C. E. Fox, *The Threshold of the Pacific*, p. 225).

Mummification is practised in parts of New Guinea, the Torres Straits, and Australia, but we are not always told who are, or were, mummified. In Queensland we are told, however, that desiccation of the dead is practised only in the case of very distinguished men (*J.R.A.I.*, 1928, p. 120). Among some tribes of Victoria the body of a chief was smoke-dried and placed in a tree till the end of a month, when it was cremated (*Folk-Lore*, xix, p. 398).

Our knowledge of mummification in America is derived chiefly from Peru. When an Inca died, his internal organs were buried with a quantity of valuable objects in the temple of Tampu, and a number of his attendants and concubines were sacrificed on the grave. His body was embalmed, and taken to the temple of the sun at Cuzco. There it remained, but was brought out into the public square, along with other royal mummies, at the installation of a new Inca, and on certain other occasions. It does not appear that any one was mummified except royalties and persons of great distinction (Prescott, *Conquest of Peru*, vol. i, pp. 29–33; vol. ii, p. 3). For the rest of America our information is incomplete and unreliable. Old accounts state that the Indians of Virginia mummified their kings, but nobody else. An early report states that on the north-west coast, mummification was reserved for the 'wealthy, popular, and distinguished' (*First Annual Report of the Bureau of Ethnology, Wash.*, pp. 131, 135). The Chibchas are said to have carried the mummies of dead chiefs into battle (Bastian, *Die Kulturländer des alten Amerikas*, vol. ii, p. 193).

In Africa, Southern Asia, America, and Australia, it is

to be noted, the great majority of tribes do not practise mummification in any form. There is then no reason to suppose it to be in any way natural or primitive, nor can environment be held responsible for a custom observed in tropical Africa, the Pacific islands, and the High Andes. The distribution of the custom suggests diffusion from one centre, as does the very remarkable character of the beliefs with which it is associated. For, if we consider the evidence which I have summarized, we shall see that not merely is mummification practised only on the body of the king, but it is certainly in Africa, Siam, and Indonesia, and probably elsewhere, associated with the belief that the king goes on living after he is dead. His reign does not terminate at death, but when his body is either buried or cremated, an event which may take place months or even years afterwards. All the evidence suggests that the object of mummification is to maintain this strange pretence. Traces of it exist in Europe in the custom of lying-in-state, which is restricted to royalties and princes of the Church, but this custom seems to be a comparatively modern introduction from the East. This belief, that the king continues to live and reign after death, is so strange that it is difficult to imagine how it could ever have arisen, and impossible to believe that it springs naturally to the minds of savages.

Let us now return to Egypt. Here also we are told that 'it must be remembered that the whole funerary cult of the Egyptians was intended only for the king. . . . Its kingly origin was never forgotten and traces of it reappear again and again' (G. Elliot Smith and W. R. Dawson, *Egyptian Mummies*, p. 136. It does not appear that Elliot Smith attempted to collate these statements with the views expressed in *The Migrations of Early Culture*, above, p. 136). Moret, again, tells us that 'at the beginning of the Old Empire only the king and the royal family are initiated into the rites of Osiris and attain the resurrection' (in *Frazer Lectures*,

p. 155). After this the religion of the Egyptians became gradually democratized (Smith and Dawson, loc. cit.; Moret, op. cit., p. 156). And Dr. Blackman has collected a series of representations from tombs of the Middle and New Empires which depict the washing of the corpse after it is taken out of the salt bath, and before its final anointing and bandaging. The whole scene is ceremonial in character, and is borrowed, as Blackman points out, from the daily temple ritual of the king (cited by W. R. Dawson, in *Proc. R. Soc. Med.*, p. 83). The body was anointed by an officiant called 'the Treasurer of the God', which title, according to Blackman, is a legacy from the time when the burial ceremonies were performed for kings only (cited by Smith and Dawson, op. cit., p. 47 n.).

Whatever the origin of mummification in Egypt, as to which I shall have something to say presently, it is clear that it was only a part of the procedure by which the dead king, and later the dead commoner as well, was resurrected not as himself, but as Osiris. The whole procedure was based on the myth of Osiris, and the dead man was supposed to go through everything that Osiris went through in the myth. In the myth he is killed by his brother Set, and his body, cut into fourteen pieces, is distributed all over the country. The pieces are collected by his sister-wife Isis, who weeps over them till the other gods come and help her to piece them together. They swathe the body in linen bandages, and Isis fans it with her wings. Osiris then revives, and henceforth reigns as king over the world of the dead (Frazer, *G.B.*, vol. vi, p. 13). Now whatever may have happened to the bodies of the dead in predynastic times, as to which Egyptologists are not agreed, it seems clear that by the time mummification was first practised, probably in the Third Dynasty, kings and nobles had for centuries been buried with their bodies entire (W. B. Emery in *Illustrated London News*, February 1937, p. 348,

and February 1938, p. 251). Yet the ritual of mummification assumes that the body had, like that of Osiris, been dismembered and scattered. 'The dead man, conceived to be lying, like Osiris, with mangled body, was comforted by being told that the goddess Nut, mother of Osiris, was coming to gather up his poor scattered limbs' (Frazer, op. cit., p. 15). 'The formulae recited during the lustration of the Osirian dead often speak of the corpse as though it were dismembered like that of Osiris' (Smith and Dawson, op. cit., p. 36). Budge gives a number of these formulae. 'The goddess Khemeturt cometh to thee . . . she presenteth to thee thy bones, she gathereth together thy flesh' (*From Fetish to God in Ancient Egypt*, p. 193). 'Horus . . . hath given unto thee thy head and collected for thee the members of thy body' (*Opening the Mouth*, p. 106). The ritual, then, seems not to correspond with anything that was actually done either at the time when mummification was first practised or in the centuries preceding. It corresponds, however, in a remarkable way with the ritual of mummification in India. Just as the ritual of mummification in Egypt was associated with the myth of Osiris, who in his form Khepera was the creator of the gods and was identified with the harvest (Budge, *Legends of the Gods*, p. 11; Frazer, op. cit., p. 107) so the ritual of mummification in India was associated with the myth of Prajapati, who was the creator of the gods (M. Levin in *Man*, 1930, p. 32), and was identified with the harvest (J. Abbott, *The Keys of Power*, p. 152). And just as the parts of Osiris were reassembled and reanimated by the gods, so the parts of Prajapati were reassembled and reanimated by the gods (*Man*, loc. cit., p. 33). For Prajapati, when he had finished the work of creation, 'fell asunder' and 'the gods gathered him out of the earth and out of the water'. 'The reconstruction of Prajapati corresponds to the mummification of the dead king' (*Man*, loc. cit., p. 34).

The ritual then diverges, and the culminating rite in India is the cremation of the mummy, and in Egypt the 'Opening of the Mouth'. Different as were these two rites, they were both intended to put life into the deceased, and had other features in common, such as the sacrificed animals, which in both cases were cut in pieces and offered to the deceased, reminding us that both in theory had been cut in pieces.

The rite of 'Opening of the Mouth', seems originally to have had no connexion with mummification, but to have been intended to put life into an image, so as to identify it with the divine being whom it represented, and we find that in Babylon there was a similar rite, performed for the same purpose, and also called 'Opening of the Mouth'. The two rites had many features in common, including not merely the animal sacrifices but also the smearing of the statue's mouth with milk in Egypt and butter in Babylon, and the fact that both rites were performed in the early morning (A. M. Blackman, in *J.E.A.*, vol. x, p. 53). Mummification, then, appears comparatively late in the history of Egypt, and in circumstances which do not suggest an Egyptian origin. Part of the composite ritual seems to be derived from Babylon, but where the actual technique of mummification came from is unknown. That it came from India direct is unlikely, since fire, so prominent in India, is much less so in Egypt. Perhaps there was some common but still undiscovered source. The problem of how mummification reached Africa, America, and Australia presents difficulties, as do certain remarkable resemblances in the technique of mummification, for example, between that of the Twenty-first Dynasty in Egypt and of the Torres Straits Islanders (W. R. Dawson in *Annals of Archaeology and Anthropology*, 1924, p. 92). That these are problems of diffusion, and not of independent invention, will be realized by those who have studied the foregoing, and have come with me to what seems

the unavoidable conclusion that its origin had nothing to do with casual discoveries or natural affection, but that it is a highly specialized rite connected with the life after death of the divine king and with the succession to the throne.

Chapter XVI

PROBLEMS OF NEGRO AFRICA

An assumption commonly made is that the negroes of Africa are a homogeneous race, both physically and culturally, that is to say that there is a kind of man who may be called an 'African' who inhabits the whole of Africa south of the Sahara, who in appearance, customs, and beliefs is totally different from a European or an Asiatic, and who was working out his own salvation and moving slowly but steadily along the path of progress without ever having been interfered with until, in the Age of Discovery, that is to say the fifteenth and sixteenth centuries, Europeans started to butt in, and spoiled the whole continent.

This assumption involves two fallacies. African negroes, to start with, are by no means racially homogeneous. Some are tall, thin, and black, but with high foreheads, thin lips, and straight noses; others are short and stout, with reddish-brown skins, but flat noses and thick lips; others again are yellowish-brown. These variations can only be explained by supposing that Africa was, in the more or less remote past, subjected to a succession of invasions, probably from Asia.

Culturally the differences are even greater than they are physically; the culture of the purely pastoral Masai, for example, differs in almost every respect from that of their neighbours, the agricultural Kikuyu. It is impossible that such differences could have arisen naturally in the same area, and here again we are driven to postulate outside influences.

In the preceding chapters we have seen that a number of traits, including the domestication of animals, and the use

of bows, outrigger canoes, and cast-nets, were invented or discovered elsewhere than in Negro Africa, and that, therefore, to the extent to which these traits exist there, the African negroes must have been subject to foreign influences. Evidence was in an earlier chapter adduced to show that the Africans, like all savages, are, and have long been, in a state of cultural decay wherever they have not been subject to such influences. It seems desirable, however, to go into the question of African Negro culture in somewhat greater detail, and to show that there is little in it which can reasonably be supposed to be indigenous.

It can be shown, firstly, that there are in many parts of Negro Africa traces of older and higher cultures than those existing to-day; secondly, that many important elements in African Negro culture are of foreign origin, and, thirdly, that Negro Africa had been frequently subjected to foreign influences long before the appearance of Europeans upon the scene.

Let us start with the fact that the inhabitants of Madagascar speak a language closely akin to the old language of Java and Sumatra. We know that Madagascar was colonized from those islands early in the Christian era, and that an active maritime trade was carried on between Indonesia and East Africa as late as the middle of the twelfth century, that is a period of over a thousand years (J. Hornell in *J.R.A.I.*, 1934, pp. 309–11). The influence of this long period of colonization and trade must have been great. Among Indonesian features in Africa, N. W. Thomas (in *Ancient Egypt*, 1921, p. 12) includes the skull cult, head-hunting, ritual cannibalism, belief that an undecomposed corpse pollutes the earth, ossuaries, and the interregnum after the death of a king (cf., p. 139, above). He also notes that West African musical instruments, weapons, and architectural features have been traced to Indonesia. The marimba, for example, an Indonesian musical instrument, is found in four widely

separated areas in West and South-west Africa (id. in *J.R.A.I.*, 1920, p. 409). Another Indonesian feature, the cultivation of the coco-nut, is limited to the east coast, while the building of quadrangular houses instead of the more usual circular ones and the use of bark-cloth for clothing are general in Madagascar, and have also a sporadic distribution in Central Africa.

Whether all these items, however, are due to Indonesian influence, or whether some of them were brought from India at an earlier date, must for the present remain doubtful. Cattle of the Indian humped species have a wide distribution in East and Central Africa, but one which suggests a centre of distribution a good deal farther north than Madagascar.

Then there is the problem of the domestic fowl. This is practically universal in Africa, yet it is an Indian bird, and in Negro Africa, as in India and in South-eastern Asia generally, it is used rather for ritual and magical than for economic purposes. It is alone sufficient to dispose of the theory that the African Negroes have developed their own culture, since it is inconceivable that they invented rites of sacrifice and augury similar to those found in Asia, and then sent to Asia for birds with which to perform them.

On an earlier page (p. 35) we mentioned Zimbabwe. The Zimbabwe culture includes many large stone buildings besides Zimbabwe itself. Miss Caton-Thompson (*The Zimbabwe Culture*, pp. 7, 196) has expressed the opinion that though the work of native Africans it owes its stimulus to Indian or other foreign influence, and Hornell (*J.R.A.I.*, 1934, pp. 329 ff.) has given reasons for thinking that Zimbabwe and the neighbouring Nanatali are but crude imitations of the great Buddhist temples of Java.

But there are many traces of ancient foreign influence in Negro Africa besides those which may be attributed to Indonesian influence. In the first place there are the

paintings and engravings on rocks and in caves; these have a wide distribution in Africa, and in South Africa are associated with the Bushmen. The leading students of these paintings derive this art from the North African coast, and agree with Goodwin that 'the technique of the Bushman paintings is identical with the technique of Spain, the materials used are the same, the same attitudes are seen, and the same disposition to depict action rather than objects'. The French authority Reygasse regards these resemblances as fundamental, and the Abbé Breuil is 'prepared to admit a real relationship between the paintings of Eastern Spain and those of South Africa'. The German Kuhn argues for a widely diffused form of palaeolithic art (W. D. Hambly, *Source-book of African Ethnology*, pp. 129, 142, 151). It is, of course, highly improbable that this cave art was diffused by itself; the probability is that the whole Eurafrican palaeolithic culture, primitive as it may seem, was diffused from some one centre.

We next come to structures built of large stones. Numbers of such ancient remains are found in Abyssinia (Hambly, op. cit., p. 155) and the Anglo-Egyptian Sudan (E. Evans-Pritchard in *Antiquity*, vol. ix, p. 151). In Uganda

> 'In one spot there are megaliths, some four times the height of a man, built up of great boulders so placed as to represent a giant figure . . . and there are traces of buildings with stone enclosures, built by people whose knowledge of stonework far surpassed the inhabitants whom the first European travellers found in the country' (Canon Roscoe, in *Frazer Lectures*, p. 26).

In the north-east of Kenya are large numbers of wells and cairns, such as are not made by the present inhabitants (C. B. G. Watson, in *Man*, 1927, p. 30).

In West-central Angola are village sites showing signs of

long occupation and still surrounded by walls made of large boulders. The present inhabitants have no traditions concerning them nor is there any reason to believe that they ever made their villages of stone (Hambly, op. cit., p. 154).

Remains of stone-built villages are found all over the Transvaal; the natives appear to know nothing about them (C. van Riet Lowe, in *J.R.A.I.*, 1927, p. 227), though they may not be older than the eighteenth century.

Along the coast of West Africa, especially near the Gambia, are many monoliths and stone circles (E. S. Thomas, in *J.R.A.I.*, 1923, p. 173; *Man*, 1926, p. 21; Hambly, op. cit., p. 153). In the Bauchi country of Nigeria are bridges of dry stone and walled stone circles; the present inhabitants do not build in stone (J. N. Justice, in *Man*, 1922, p. 3).

Hambly (p. 159) concludes:

> 'That the utilitarian building in stone, as well as the erection of ceremonial stones, might have several independent centres of development is not impossible; but by inference from the general data of invention and diffusion as seen in modern times, and with due regard to the African routes along which the principal stone erections occur, a succession of independent mutations is far less likely than a gradual penetration of cultures which assumed local variations as the immigrant waves advanced.'

In Uganda, pottery figures have been dug up which apparently represent Africans, but are of a type otherwise unknown in Africa and quite foreign to the present-day cultures of Uganda (*Man*, 1933, p. 29). In Nigeria tin beads have been found at a depth of twelve feet or more; the present inhabitants do not work in tin (J. N. Justice, loc. cit.).

There are found over a large area in Abyssinia, Kenya, Uganda, Tanganyika, and Northern Rhodesia the remains

of systems of terraced cultivations. These terraces are all of the same type, and traces of them are almost continuous throughout the area. Certain tribes within the area still use terraces and practise irrigation, but in general the terraces are now unknown to the natives and, judging by the apparent age of the trees growing upon them, seem to have been abandoned at least eight hundred years ago (G. E. H. Wilson, in *Man*, 1932, p. 45). Similar disused terraces are found in the Bauchi country of Nigeria (J. N. Justice, loc. cit.). Within the terraced area, in Kenya, are what appear to be the lines of carefully graded ancient roads (G. W. B. Huntingford, in *Man*, 1933, p. 45). Africans never make such roads. Terraced cultivation is widespread in Asia, and its temporary appearance in Africa is probably due to Asiatic influence.

It is pretty clear, then, that the cultures of Africa, or at any rate of East Africa, were profoundly affected by traits introduced from Asia, of which many have been lost, though some still persist. But while these traits were coming in across the sea, it seems that others, or the same ones in other forms, were being introduced from Egypt, the influence of which 'on the remaining culture-areas must have been profound' (M. J. Herskovits, in *Africa*, vol. iii, p. 75). Professor Seligman holds that 'a gradual infiltration of Egyptian ideas into black Africa must have existed from early times, presumably as early as the Pyramid Age' (*Egypt and Negro Africa*, p. 3). He traces many striking parallels between the divine kingship in modern Negro Africa and in Ancient Egypt. He figures (p. 64) West African musical instruments exactly like those of Ancient Egypt, and oxen from the Southern Sudan with their horns deformed exactly as shown in Ancient Egyptian drawings (in *Essays Presented to F. Ll. Griffith*). Other African Negro traits which are believed to be due to Egyptian influence include the *shadûf* (the draw-well with counterpoise), the loom, and the

technique of coiled basketry, as well as certain types of canoe and harpoon (Hambly, op. cit., p. 77).

Contact between North and West Africa has been more or less continuous from early times. In the pre-Islamic times it was kept up by the Tuareg, who seem once to have been Christians, and later by the Berbers, who in the eleventh century converted numbers of the negroes of Senegal to Islam. In addition there were the Jews; many of these are said to have fled across the Sahara after a rebellion against the Romans in A.D. 115, and there seem still to have been Jewish tribes on the Upper Niger as late as the eleventh century (E. W. Bovill, *Caravans of the Old Sahara*, pp. 24, 27, 47, 63).

Then there is the Hamitic problem. It is doubtful where the Hamites came from and in what their culture originally consisted, but people who are so called by ethnologists, and who in race and language are clearly related to the Arabs, were the principal element in the population of Ancient Egypt, as they are in modern Abyssinia and Somaliland. They have profoundly influenced the language and racial type of the pastoral tribes of East Africa. The African cattle cult, in which cattle are regarded as sacred animals, extends from the Nile almost to the Cape, yet the cult, like the cattle on which it is based, is certainly not of negro origin.

There is no trait which is peculiar to Negro Africa, and no trait, except perhaps the use of tobacco, which is found throughout Negro Africa. Such widespread and important traits as the use of iron, corn-growing, and cattle-keeping have been introduced from outside, in common with many less important traits. The possession of any particular trait by any tribe is due to nothing more than historical and geographical accident.

'To regard culture as a jumble of disconnected and unrelated details', says Professor Malinowski (in *Human*

Affairs, p. 224), 'robs our whole concept of culture of all life and significance.' But the question for the scientist is not whether a concept has life and significance, but whether it is true. No one who has studied the origin and distribution of any of the culture traits found among the African Negroes, can maintain that the culture of any tribe can be represented as anything more than a patchwork quilt, of which the pieces, selected largely by chance, have faded into a superficial appearance of homogeneity.

Chapter XVII

PROBLEMS OF AMERICA

In previous chapters we noted that a number of what we are apt to regard as simple discoveries and inventions, such as the use of iron, the wheel, glazed pottery, the plough, the cross-bow, the cast-net, were unknown in America until they were introduced by Europeans. To these we might add others, such as the arch and stringed musical instruments. We have also seen reason to believe that other elements, such as agriculture, the sinew-backed bow, and the art of pottery-making, were introduced across the Pacific. Most Americanists do not admit that they were, but anyhow these traits form but a small part of the culture (or cultures) of pre-Columbian America, and we have now to consider whether the basic elements of these cultures were introduced from across the Pacific, or whether they were developed locally.

It is clear that the whole case for culture diffusion, as opposed to multiple independent invention, depends on America. If men's minds always work alike, they must work alike in adjacent villages as well as in widely separated continents. Boas assures us that 'the theory of independent origin of almost identical phenomena in contiguous areas can no longer be maintained, and has been given up by serious students' (F. Boas, *Primitive Art*, p. 121). But why limit it to contiguous areas? If the art of pottery-making could be discovered independently in Great Puddleton and in Yucatan, why not also in Great Puddleton and Little Puddleton? The only possible answer seems to be that men's minds cannot work alike unless their bodies are widely separated, but it is unlikely that this answer would commend itself to Professor Boas.

For many years this alleged similar working of the human mind, or 'psychic unity', has been used as a tap to be turned on or off as required at the moment. We are told, for example, that the Aztecs and Egyptians 'developed the idea of the pyramid tomb through that psychological similarity which is as much a characteristic of the species man as his physique' (a former edition of *Ency. Brit.*). If pyramids were not found in America, no one would suggest anything of the kind, since in the Old World pyramids are limited to regions which are known to have been in cultural contact. It is, at any rate, obviously untrue, since if it were true we should find pyramid tombs wherever people had the rudiments of stone-working, and our churchyards would be crowded with them. The fact is that, as Professor Lowie tells us (*History of Ethnological Theory*, p. 77): 'general "psychic unity" will not do; on that assumption all the societies of the world should share the features in question'. Yet his contempt for any one who suggests an Old-World origin for the American pyramids is unbounded; for him, as for nearly all Americans, what Dr. Harrison calls the 'anthropological Monroe doctrine' is a bar to dispassionate inquiry.

There is, of course, no direct evidence for the derivation of American (that is to say, pre-Columbian) culture from the Old World—if there were this chapter would be superfluous —but the circumstantial evidence may be considered under five headings:

(1) American culture has no beginnings.

(2) It is fundamentally ill-balanced.

(3) All the centres of civilization were on or near the Pacific coast.

(4) All the close cultural parallels are with Eastern Asia or the Pacific islands.

(5) The religion of Mexico is heavily tinged with Asiatic, and particularly Buddhist, conceptions.

These are, of course, supplementary to the considerations, both general and particular, which have been discussed in the earlier chapters.

To take the first, the highest civilization of America was that of the Mayas. There is much difference of opinion as to the date of the beginning of this civilization; most authorities place it in the early centuries of our era, though some place it later and some earlier. Kidder (in *Essays Presented to Kroeber*, p. 150) says that we must place the beginnings of American civilization at at least 1000 B.C. if we are to account satisfactorily for the perfection of the Maya calendar, but admits that no traces of such an early culture have been found. In any case its earliest known period is its best, and it exhibits a progressive decline till the coming of the Spaniards, when it was already completely decadent.

In Mexico the Spaniards found a civilization flourishing which was, however, lower than that of the Mayas at its earliest and best. For the Mexican civilization, like that of the Mayas, no beginnings have been found.

In Peru the Incas appear suddenly with a civilization which succeeds a different but equally high civilization; this likewise has no beginnings.

There are other civilizations of North America, but they must have been derived from Mexico or farther south, since they are associated with the cultivation of maize and other Central American food-plants. And their crafts have no beginnings. 'All techniques of basket-making found in modern North America existed prehistorically. . . . Whatever the roots or origins of these basketry arts may be, their divergent form and highly technical development were already present in our earliest remains' (G. Weltfish, in *Am. Anth.*, vol. 34, p. 117). It is, of course, clear that if American civilization was developed in America, it must have been developed through a series of stages, and that no trace of

such stages has been discovered affords a strong argument, though not, of course, a proof, that American civilization was not developed in America.

Now to our second point, that the culture of America is, or rather was, fundamentally ill-balanced. While it is not suggested that the originators of an invention are always those who bring it to perfection, or that progressive societies progress equally all along the line, it appears to be the fact that in societies in which any advance is taking place, there is a general advance towards the limits of their own particular cultural horizon. The centres of ancient civilization, those in which we have reason to believe that inventions were made, Babylon, Elam, Egypt, the Indus Valley, Greece, China, all of them reached, whether through their own efforts or through borrowing, a general level of culture in all respects above that of savages. Those societies, on the other hand, which have invented nothing for themselves, but owe their culture to reminiscences or occasional injections of civilization, such as we have good reason to consider those of Negro Africa or Polynesia, exhibit great contrasts between marked development in some directions, and a complete lack of it in others.

Judged by this criterion, the cultures of Middle America must be placed in the latter, that is the lower class. There were highly complex systems of social organization; great proficiency in building and carving; an advanced calendar; and a highly developed system of picture-writing. But no Old-World culture which was so highly developed in these respects was so backward in others. The Americans had a highly developed agriculture, and domestic animals, but no plough; a knowledge of copper-working, but not of iron-working; various types of boat, but no sea-going ships; sledges and travoises, but no wheeled vehicles; bows but not cross-bows; stone houses, but no chimneys; the push-quern, but not the rotary quern. On the supposition that

they were a race of inventors it is impossible to explain these and similar facts, but on the supposition that they, or at any rate the most highly civilized elements among them, were immigrants, it is easy. They might well have forgotten the plough and the wheel before they had domesticated the llama, and lost their blacksmiths before they came upon iron ore and their shipwrights before they had occasion to build ships.

What we find in America is very much what we might expect to find in Australia if about 1850 it had been completely cut off from Europe. The Australians would, of course, be now quite ignorant of all the inventions made since then, and would have forgotten many devices owing to the lack of craftsmen, or materials, or demand for them in the new environment. Many civilized arts would still be carried on, but with inferior tools. Archaeologists of the future would find a civilization with no beginnings, unless they were able to persuade themselves that these inferior tools were independent local inventions.

A feature of American culture was not only that it was ill-balanced, but that its highest features led to so little. In the Old World the discovery of the calendar led to the sciences of astronomy and physics, and the arts of navigation and surveying; in American it was used for ritual only (Wissler, *Man and Culture*, p. 192). In China picture-writing led to the production of a wonderful literature; in America there was picture-writing, but the literature was insignificant. The effectiveness of the Mongolian method of arrow-release (see p. 80) contributed largely to the foundation of the Turkish, Mogul, and Manchu empires; claimed by Kroeber (*Univ. Cal. Pub.*, vol. 23, p. 289) as an independent American invention, it was there limited to an unimportant Californian tribe. The failure of the pre-Columbian Americans to make good use of such inventions as they had suggests that these inventions were imported.

We next come to the fact that all the centres of civilization were on or near the Pacific coast. Why were the Indians of New England so much lower in the scale of civilization than those of Arizona? To say that the latter got their civilization from Mexico is no answer, for the same question arises with respect to that country. According to the accepted theory, man made his way into America across Bering Strait; to do this he must have been accustomed to a cold climate, yet he only developed a civilization in a hot one. The probable reason is that while man may have come in first by Bering Strait, his civilization came later by sea across the Pacific. The same argument applies even more forcibly to South America. How is it that civilization was confined to the inhospitable region of the Andes, while the most fertile and now most prosperous regions, such as those round Rio de Janeiro and Buenos Aires, remained in a state of savagery? Although these regions are the most fertile, their present prosperity is due largely to the fact that they are nearer to Europe, their source of civilization; Peru is nearer to Asia, which was its probable source of civilization.

The idea that China may have influenced Peru is strange to Europeans, since we are brought up to regard China as the farthest east and Peru as the farthest west, as they appear to be on a map of the world drawn on Mercator's projection. We find it difficult to realize that it is only forty miles from Asia to America across Bering Strait, and that wide as is the Pacific, some of the islands of Polynesia, in particular Hawaii and Easter Island, are nearer to America than they are to Asia or to the westernmost islands of Polynesia. It is therefore obviously possible that those who colonized Hawaii might have gone on and reached California, and that those who colonized Easter Island might have gone on and reached Peru. Whether we come to the conclusion that they did so depends on how we interpret the evidence.

Most Americanists make no attempt to weigh the evidence

at all. They state, simply but emphatically, that nothing ever was, or ever could have been, diffused across the Pacific. Wissler does not agree with this; he holds that a great number of American traits, including the fire-drill, the bow, the harpoon, simple baskets and nets, wooden slat armour, and the domesticated dog, probably came from Asia via Alaska (*The American Indian*, pp. 302, 399). Yet he assures us that:

> 'Independently the New World developed agriculture, pottery, the higher types of basketry and cloth weaving, the working of the softer metals and the manufacture of bronze. The progress in astronomical knowledge and the fine arts compares favourably with that of the early Asiatics. Yet, in all, we see the marks of originality which are alone sufficient evidence of their independent origin' (ibid., p. 396).

He bases his belief also on the differences in language between America and the Old World. Yet both these arguments apply equally to China. We know that the culture of China was profoundly influenced from India and Persia, yet its culture is more strikingly original and its language more strikingly different than anything which has been found in America. Originality in art consists not in invention but in choice; the Chinese had a wider field of choice than the Americans, and developed a more original art. Wissler's assertions as to the inventiveness of Americans are not based on any evidence, but merely on arguments which are demonstrably fallacious.

Let us turn to Nordenskiold; he admits the possibility of diffusion, but maintains that any invention which has no exact parallel in the Old World must have been made in America. He says, for example, that 'a couple of bee species have been adopted for cultivation by the Indians. That this

is a perfectly independent invention is quite obvious' ('The American Indian as Inventor,' in *J.R.A.I.*, 1929, p. 280). But it is very likely that immigrant bee-keepers would adopt native bees; Nordenskiold assumes what he sets out to prove, and thereby begs the whole question.

A great part of his discussion is concerned with agriculture, and particularly the cultivation of maize. Maize, though it has never been found wild, is in all probability a native of America, and must therefore have been first cultivated there. It does not however follow, as Nordenskiold asserts, that 'a good many of the implements that were used in connexion with the cultivation of maize . . . (and) the different dishes prepared from maize must be of Indian origin, as well as different methods of storing maize' (loc. cit., p. 275). It may well be that the first cultivators of maize were immigrants. Maize is believed to be closely related to a grass which grows wild on the southern plateaux of Mexico, and nowhere else. Its diffusion from one source is indicated by its continuous distribution from the St. Lawrence to the Plate, and by the fact that it forms part of a complex which includes the bean and the squash (Forde, op. cit., p. 431).

According to Forde (ibid., p. 428):

> 'There is little doubt that the cultivation of cereals both with the hoe and the plough is everywhere in the Old World part of a single complex process of accretion. One by one other grasses have been added, and in various areas, to those first cultivated by the people who cleared the banks of some flooding river in order to scatter the seeds of still wild emmer and barley.'

There seems no reason to confine this process to the Old World. It is probable that cultivated rye and oats originated as weeds in fields of wheat and barley, and under conditions

especially favourable to them displaced their hosts (N. I. Vavilov, *Studies in the Origin of Cultivated Plants*, pp. 203, 214). Maize much resembles millet and may have originated as a weed in fields of millet introduced into Mexico by settlers from South-east Asia.

That cultivators from across the Pacific did in fact reach America is made almost certain by a study of the history and distribution of the sweet potato. It is now established almost beyond the possibility of doubt that the sweet potato, a plant of American origin, was a staple food in Hawaii and New Zealand before the European discovery of America. In New Zealand more than twenty varieties were grown. A full consideration of all the known facts convinced Professor Dixon, who had previously been a champion of the anti-diffusionist view (see pp. 8, 69) that 'either Polynesian voyagers reached American shores and successfully returned bringing the sweet potato with them, or that Peruvian or other aboriginal Americans sailed westward with the plant and arrived in some part of Polynesia' (*Am. Anth.*, vol. 34, p. 59). As the Polynesians had sea-going ships and the Americans had not, it looks as if it was the Polynesians who brought the sweet potato from America, unless indeed the agent was some third party, such as the Chinese or Javanese.

Though this seems to be the only case in which there is actual proof of culture contact across the Pacific before the days of Columbus, there is a great deal of evidence which makes such contact probable. If all the inventions which were found in America were made there, there is no reason why they should resemble those of one part of the Old World rather than another. But in fact all the close parallels are with the Far East and none of them with the West.

'Why is it', asks Dr. Harrison (*Pres. Ad.*, pp. 23, 24) 'that there is so much in the higher, as well as in the lower,

American cultures that compels comparison with Eastern Asia, and not with, let us say, Neolithic or Bronze Age Western Europe?' He answers the question by emphasizing his 'strong belief that the culture of the American Indian is a derived culture, in all essentials, and that an explanation is to be sought in frequent contact with Asia.'

How far this contact was accompanied by actual migration we cannot tell. It has been pointed out (e.g., by Hrdlicka, *Man*, 1924, p. 84) that many Asiatics and Polynesians, and particularly the inhabitants of Formosa and the Philippines, are so like American Indians as to be indistinguishable from them. This might be accounted for by early migrations across the Bering Strait. But Hooton (*Apes, Men and Morons*, p. 185) finds skulls of negroid type among those of the early inhabitants of New Mexico; did these too come across the Bering Strait? The popular belief that the American Indian is red, while Asiatics are yellow or brown is not in accordance with the facts, which show it to be at least possible that there was considerable migration across the Pacific.

It might be supposed that if there had been such migrations or other contacts, there would be some reference to them in Chinese literature, but Chinese references to foreign countries are vague in the extreme. Laufer (*Sino-Iranica*, p. 468) gives some examples, such as that Po-Se, normally Persia, must often be taken to refer to a part of Malaya. Help is then hardly to be expected from records, and as for traditions, I have tried elsewhere (in *The Hero*) to show that they never have any historical value.

Our further evidence, then, must be drawn from traits in which American culture finds parallels in limited areas of the Old World, and those in particular which are limited to the shores of the Pacific.

Let us start with stone statues. To make these may seem

natural, but in the earliest times of which we have any knowledge their distribution was limited to Egypt, Southern and Eastern Asia, Polynesia, and Middle America. They seem to have been first introduced into Europe, that is to say Greece, from Egypt about 800 B.C., but did not reach Western Europe till they were brought by the Romans. They seem never to have been known in Negro Africa, or in Northern or Central Asia. Their early distribution, in other words, is within the area of mummification (see p. 136) and the art is probably connected with that practice. Pyramids have a similar distribution.

We shall presently consider some more specific resemblance between the religious beliefs of Middle America and those of Eastern Asia, but I would first give a few examples of simpler culture parallels on both sides of the Pacific.

Pyro-scapulimancy is the name given to a curious method of divination which consists in scorching the shoulder-blades of animals and prognosticating in accordance with the patterns thus formed. I have no doubt that many who have never heard of the practice will nevertheless, when they learn that it is found on both sides of the Pacific, maintain that it is the kind of thing which would occur naturally to any one. That, however, is not the view of Mr. J. M. Cooper, who tells us (*Essays to Kroeber*, p. 40) that 'one important point has emerged from the newer evidence, namely, the genetic link between Asiatic and American scapulimancy.'

Wissler, as we saw above, holds that wooden slat armour was brought across the Bering Strait by the original immigrants. In America, however, it is confined to a small area on the North Pacific coast. Had it come across as Wissler suggests, its distribution would almost certainly be wider. In California also is found, as we have seen, the Mongolian arrow-release, and there is another custom found there which is otherwise peculiar to China, namely, that by which two

people of the same name may not marry, even if they are not related.

> 'Some of the Déné coiled globular baskets are almost identical with a Chinese style,' and 'we find baskets in some of the Pacific islands which can scarcely be distinguished from cane baskets of the New World, if we consider the designs only' (Wissler, *Man and Culture*, pp. 52, 79. The Déné Indians live in British Columbia).

In the Andes the llama was kept as a pack animal, and for its wool and meat; the alpaca was kept for its wool. Neither animal was ever milked. 'The Indians as a whole seem to be as deeply prejudiced against milk as the Chinese' (Wissler, op. cit., p. 36). The pigtail was formerly widespread in Eastern Asia, and also in Peru, Ecuador, and Bolivia (R. Enoch, *The Secret of the Pacific*, p. 234).

The featherwork of Mexico and Peru has a 'striking parallel' in Hawaii (Wissler, op. cit., p. 60).

> 'The most common type of comb in South America is the composite comb, which is made of hard and slender strips of wood or bamboo lashed together. Often the sticks are inserted between two cross-pieces and form a double comb. . . . Similar combs are typical of both Melanesia and Polynesia' (K. Birket-Smith, in *Ethnos*, 1937, p. 33).

Tie-dyeing is a process of producing stripes or spots on cloth by tying pieces of string round rolls or pinched up pieces of the cloth, and then dipping it in dye. Pieces of cloth treated in this way are found in the ancient cemeteries of Peru, but nowhere else in pre-Columbian America. In the Old World the art has a pretty wide distribution, but according to Dixon (*The Building of Cultures*, p. 198) it is known to have originated in Southern Asia. From there it reached Europe, and was introduced by the Spaniards into Mexico. The probability is that it was introduced into

Peru from Asia, just as it was later introduced into Mexico from Europe.

In the sixteenth century there was a regular trade between the Philippines and Spanish America, and Hough (*Am. Anth.*, 1900, pp. 66 ff.) warns us against supposing that what was brought in by this trade was there before. He concludes, however, that the game known to the Hindus as *pachise*, and to the Mexicans as *patole*, was in America before Columbus.

As a last example I shall return to Easter Island (see p. 31). According to Klara von Moeller (*Zeitschrift für Ethnologie*, 1937, p. 7) there are many close parallels between the drawings and carvings found on this island and those of Ancient Peru, and some of the very complex picture-writing signs are apparently identical.

And now to the religion of Ancient Mexico. Many Mexican drawings show a god or monster with what is unmistakably a trunk. The opinion that it was the trunk of an Indian elephant was put forward by Elliot Smith, but in this he was merely following Humboldt, who (*Vue des Cordillères*, p. 92) figures a priest sacrificing a human victim. The priest wears a mask which suggests the head of an elephant, and 'presents resemblances to the Ganesa of the Hindus which are remarkable and seem by no means accidental'. Humboldt points out the resemblances between the Mexican calendar and the calendars of Asia. He says that the Mexican

> 'Nine lords of the night correspond to the nine astrological signs of several Asiatic people' (p. 145). 'The peoples of Asia, like those of America, have special names for the years included in a cycle; they still say at Lhasa and at Nagasaki, as they formerly did in Mexico, that such and such an event took place in the year of the rabbit, the tiger, or the dog' (p. 149).

He points out that of the twelve names of the days in the Mexican calendar eight (water, sea-monster, tiger (ocelot), hare, serpent, bird, monkey, and dog) figure in the zodiac of the Chinese and Tibetans, and that several of these, as well as the other four (cane, knife, sun's path, and house) are among the lunar houses of the Hindus (p. 157). The sun's path in Mexico is represented by three footprints, and in India the footsteps of the sun-god Vishnu are also represented by three footprints. He concludes that 'it is extremely probable that the peoples of the two continents drew their astrological ideas from a common source' (p. 161).

In a recent work Professor Hentze compares a number of ritual objects from Ancient China with temple carvings, paintings, and cult objects from pre-Columbian America, and points out many striking resemblances. These include a feathered serpent with a single foot; a serpent with one head and two bodies, ornamented with a pattern of diamonds with dots in the centre; a face composed of twisted serpents; a head ornament consisting of a double volute surmounted by a crescent; a bird with a human face on its breast; a monster with a human being emerging from its mouth. On both sides of the Pacific these and many other such features occur in association, and apparently formed part of similar religious cults. The Maya god Chac, for example, is associated with the rain and the lightning. He is represented with a trunk, has double volutes, and is accompanied by a water-serpent and a dog. All these features are found in association in Ancient China.

Professor Hentze (*Objets Rituels, Croyances et Dieux de la Chine Antique et de l'Amèrique*, p. 92) concludes that:

> 'It is impossible to consider the simultaneous existence of such a complex in the two continents as a phenomenon of convergence produced by the chances of independent evolution.'

In this chapter I have tried to avoid citing the facts and arguments used by Sir Grafton Elliot Smith in his *The Diffusion of Culture*. It is impossible to do this altogether, and I shall conclude by following him in a quotation from a communication made to the British Association in 1894 by Sir E. B. Tylor.

> 'In the religion of old Mexico four great scenes in the journey of the soul in the land of the dead are mentioned by early Spanish writers after the conquest, and are depicted in a group in the Aztec picture-writing known as the Vatican Codex. The four scenes are, first, the crossing of a river; second, the fearful passage of the soul between the two mountains which clash together; third, the soul's climbing up the mountain set with sharp obsidian knives; fourth, the dangers of the wind carrying such knives in its blast. The Mexican pictures of these four scenes were compared with more or less closely corresponding pictures representing scenes from the Buddhist hells or purgatories as depicted on Japanese temple scrolls. Here, first, the river of death is shown, where the souls wade across; second, the souls have to pass between two huge iron mountains, which are pushed together by two demons; third, the guilty souls climb the mountain of knives, whose blades cut their hands and feet; fourth, fierce blasts of wind drive against their lacerated forms, the blades of knives flying through the air. It was argued that the appearance of analogues so close and complex of Buddhist ideas in Mexico constituted a correspondence of so high an order as to preclude any explanation except direct transmission from one religion to another.'

One explanation of these resemblances which has been put forward is that the Chinese and the American Indians

are both Mongols, and that Mongol mentality tends naturally to these forms of thought. The fact is, however, that the Chinese derived many of these ideas from India, and the Indians are not Mongols.

The facts mentioned in this chapter must be known to all Americanists, but for the most part they are content to ignore them, and to follow the veteran archaeologist H. J. Spinden, who assures us that 'the sky-line of Tikal with its terraced pyramids rises as a mirage out of the past only to find a splendid counterpart in the terraced skyline of New York' ('Origins of Civilization in Central America and Mexico', in *The American Aborigines*, p. 246). Both are a hundred per cent American, and no more need be said.

Chapter XVIII

THE FOUNDATIONS OF CIVILIZATION

IN the earlier chapters we saw reason to believe, both on *a priori* grounds, and from a study of existing savages, that savages never invent or discover anything. Our evidence further indicated that if left to themselves they do not, as Goldenweiser (*Anthropology*, p. 412) irrationally assumes, 'some day experience intellectual illumination', but sink slowly but steadily lower in the scale of culture.

We also saw that the civilized peoples of the past have not continued indefinitely to progress, or even to maintain their civilization, but have had their periods of rise, of splendour, and then of decay.

Sir Flinders Petrie has tried to systematize and explain this latter phenomenon (*Revolutions of Civilization*, p. 114):

> 'We have represented the wave of civilization as falling to a *minimum*, and then suddenly rising again. To what is this change due? In every case in which we can examine the history sufficiently, we find that there was a fresh wave coming into the country when the earlier wave was at its lowest. In short, every civilization of a settled population tends to incessant decay from its *maximum* condition; and this decay continues until it is too weak to initiate anything, when a fresh race comes in, and utilizes the old stock to graft on, both in blood and culture. As soon as the mixture is well started, it rapidly grows on the old soil, and produces a new wave of civilization. There is no new generation without a mixture of blood.'

The civilization of Ancient Egypt rose and decayed several times, and, comparing these cycles with the revolutions of

European civilization from Minoan times till the present day, he claims to be able to recognize a normal cycle in the rise, progress, and decay of civilizations. According to this scheme, every invasion by a new people is followed by a period of from four to six centuries of autocratic rule, during which the arts gradually rise. Then come four to six centuries of oligarchy, during which the arts flourish, and, lastly, about four centuries of democracy, during which the arts gradually decay.

> 'When democracy has attained full power, the majority without capital necessarily eat up the capital of the minority, and the civilization steadily decays, until the inferior population is swept away to make room for a fitter people' (ibid., p. 124).

He also claims that the arts have always followed each other in the same order, the first to rise and to decay being sculpture, followed in succession by painting, literature, and mechanics.

Sir Flinders' theories are eminently worthy of consideration, since it is only by such attempts at synthesis that a true science of sociology can arise. Not only, however, are his generalizations too sweeping, but there are difficulties in the theory itself. Reduced to its simplest terms, it implies that the rise of civilization is due to the conquest of a people which has lost its culture by a people which never had any.

Apart from this, he makes no allowance for the influence of contemporary civilizations upon one another.

> 'The T'ang period—perhaps that of China's greatest brilliance—was marked by the influx and ready acceptance of foreigners and of foreign (Western and Indian) ideas' (C. G. Seligman, in *Antiquity*, 1937, p. 10).

There can be no doubt that a readiness to welcome foreign ideas has been a characteristic of all rising civilizations, but

that of course does not explain how they came to be rising. Retrogression is, as we have seen, the normal tendency of mankind, but

> 'given that degradation of culture has taken place on an immense scale, how is advance in culture to be accounted for? . . . The study of the conditions that decide when and where cultural advances are made is one of the most important that men can pursue; for when the problem is solved we shall be able so to order our society as to realize the fullest possibilities of development of mankind' (W. J. Perry, *The Growth of Civilization*, p. 125).

It is often assumed that decay is always due to the dead hand of conservatism, and it is of course the fact that religious or political theories which involve a belief in the infallibility of the ancients must lead to decay; we cannot stand still for long, and if we are not allowed to go forward we must go backward. It is less often realized, on the other hand, that decay of culture can be brought about even more rapidly by breaking away from the past; by the belief that we could and should go back to nature, shaking off the burden of tradition and all that it entails, and living and developing in the innocent freedom of primitive man. People who think like this fail to realize that man became man by getting away from nature, and that it is unnatural not merely to cook food and wear clothes, but to read and write, and even to speak. We learn these arts not from nature, but from tradition. The belief that primitive man was wiser and better than we are is really a symptom of degeneration, of 'that degeneration of democratic theory which imagines that there is a peculiar inspiration in the opinions of the ignorant' (John Buchan, *Augustus*, p. 340). Ignorance is the leading characteristic of the savage, ignorance not merely of the arts of civilization, but of hygiene, of biology, and of the laws of nature in

general. These are replaced by irrational superstitions, which are, as the word itself implies, survivals from the past. The real primitive man disappeared tens of thousands of years ago, and we cannot revive him. He belonged to an age when the ancestors of the white, the black, and the yellow man were still one race, upon which the forces of evolution were still actively at work. We can no more get back to this stage than to the stage at which birds were as yet undifferentiated from reptiles. And to attempt, by throwing off the traditions upon which civilization is based, to get to the level of the savage, is to go downhill by leaps and bounds, instead of by the usual process of gradual subsidence. It is true that savages lack certain of the ills of civilization, but with them ignorance, superstition, hunger, disease, and anarchy are for the most part chronic rather than sporadic. Hence the enormously high death rate, which is a universal feature of savagery. That one of these ills, disease, has been often temporarily accentuated by contact with civilization has diverted attention from the fact that alleviation of the others has been due to such contact, and the consequent introduction of arts, food plants, domestic animals, and various forms of knowledge.

But the alleviation of these or other evils, either among savages or the civilized, will not bring about progress. The removal of evil is merely a negative process, and cannot bring about a positive result. It is believed almost universally that the removal of evil produces good, but this is an utter fallacy; any one who has had an aching tooth out could say, if he thought about it, that it merely produces dullness.

And just as good is something more than the absence of evil, so civilization is something more than the absence of savagery.

'In the course of the long struggle for existence,' says Sir Peter Chalmers Mitchell (*My Fill of Days*, p. 209),

'man has been moulded by the forces of nature to robuster purposes than chopping logic, writing poetry, or developing theories, and these higher functions of the brain can flourish only in the secluded garden of an artificial civilization.'

But all culture is artificial, and what we call civilization is an extreme form of artificiality, limited to small minorities even in the most civilized countries. Frazer (*Golden Bough*, vol. i, p. 236) notes the existence of 'a solid layer of savagery beneath the surface of society', and wonders 'whether the impulsive energy of the minority or the dead weight of the majority of mankind will prove the stronger force to carry us up to higher heights or to sink us into lower depths'.

Reformers and philanthropists proclaim as their ideal 'the greatest happiness of the greatest number', but fail to realize that this ideal is quite distinct from the ideal of progress, and may be incompatible with it. Sentimentalists may imagine that new culture forms arise from the 'communal mind' or the 'spirit of the folk' or some such abstraction, but the fact is that new ideas can only occur to individuals and do only occur to highly exceptional individuals. The very fact of their newness is bound to make them 'appear shocking and subversive to the conventional many' (C. E. M. Joad, *Liberty To-day*, p. 121). To be shocked makes for unhappiness, so that as part of the plan for securing the greatest happiness for the greatest number it would be necessary to guard people from new ideas. That heaven, a place where there could be no new ideas and no progress of any kind, is the ideal of happiness to the vast majority of the race, should suffice to show that there is no connexion between happiness and progress, but people are readily deceived by words, and the 'social reformer' is regarded as 'progressive' because he wishes to ensure that every one has enough to eat. A society might be progressive in which nine-tenths of the people were starving; the Athens of Plato

and Aristotle was progressive, although nine-tenths of the people were slaves. On the other hand, a society in which every one had enough and no one too much might be happy enough, but would almost certainly be on the cultural down-grade. I say almost certainly, since savages are all on the down-grade whether they have enough or not, and there has never been a civilized society in which all have had enough.

In any case we must grasp the fact that the conditions under which civilization now progresses must be very different from those under which it came into existence. Progress is, as we have seen, brought about by scientists who, working upon a vast body of accumulated knowledge, are enabled to discover new facts, and incidentally to dissipate ancient superstitions. But their discoveries and inventions can throw no light on the origin of civilization. Sociology may one day tell us how to produce the socially perfect man, and eugenics may tell us how to produce the physically perfect man, but the former can throw no more light upon the beginnings of civilization, or even of culture, than can the latter upon the beginnings of humanity. It is the same with psychology. Psychologists can study modern man, who, whether savage or civilized, is the product of tradition, and also the ape, which has no tradition, but the originators of tradition disappeared perhaps half a million years ago.

It is the same in every branch of knowledge. A man might be an expert in every detail of the steam-engines of to-day, but this knowledge would not enable him to say how the steam-engine came to be invented, and if he attempted to deduce its earliest uses from the principal uses to which it is now put, that is to say for railways and ships, he would be wrong. Recent developments do not help us to get back to the original form, but take us farther away from it; nor are we much helped by such obsolete locomotives as are still used in remote parts of the world, though these may indicate some of the stages through which the steam-engine has

passed. Our only hope of discovering its origin is to study it historically and archaeologically in the place where it was first developed. We shall find that it was very different, both in form and purpose, from those in ordinary use to-day, and that its inventors, though we must allow them to have been scientists, were very different from the professional scientists of to-day, trained as these are by scholars, that is to say teachers and text-book writers. The scientists of the seventeenth century were but little interested in the utilitarian aspect of their inventions. Their object was to cause wonder and surprise, to produce 'a most incredible thing, if not seen' (E. Dircks, *Life of the Marquess of Worcester*, p. 452). Nothing was farther from their minds than the idea of developing their inventions for the purpose of altering the conditions under which they lived, and Lee's stocking-frame, being useful, was regarded as anti-social and suppressed.

Yet our ancestors of three centuries ago were very like ourselves. They lived, many of them, in the same houses, and enjoyed the same books, plays, and pictures. The historian of the distant future will probably put us all into the same chapter. The fact that their ideas on the subject of invention were so different from our own should make us realize the absurdity of assuming that the inventors of 5000 or 10000 B.C. were 'progressive' in any sense in which we use the term.

We have seen that many of the principal discoveries and inventions upon which our civilization is based can be traced with considerable probability to an area with its focus near the head of the Persian Gulf, and such evidence as there is suggests that they were made by ingenious priests as a means of facilitating the performance of religious ritual. It is at least possible that animals were first domesticated for convenience in sacrifice and that the first use of the plough was as a method of symbolically fertilizing the soil; the first wheel may have been a labour-saving device for keeping the

sun on its course, and metal-working may have started with the making of imitation suns in gold; the first bow and arrow may have ensured victory by symbolically destroying enemies at a distance; mummification kept the dead king ritually alive, and the kite conveyed his spirit to the sky. There is *some* evidence to support all these suggestions, and its cumulative effect strengthens the theory as a whole, the theory, that is, that civilization originated in ritual, though of course a great deal more evidence would be required to establish it. Alternative theories have no evidence to support them at all.

Any such theory will of course be rejected out of hand by the rationalizers, who are to-day the curse of sociology, as their predecessors were of biology.

> 'Natural historians a century ago', says Savory (*Mechanistic Biology and Animal Behaviour*, p. 6), 'told us what they saw an animal do, and they confidently added a statement of its purpose and a description of the state of mind in which it undertook the action in question. The animal was treated exactly as if it were a low-grade human being, conscious of its needs, and trying as best it could to achieve its ends.'

He goes on to show that until this attitude was abandoned no scientific study of animal behaviour was possible.

Sociologists of to-day adopt exactly the same attitude as the naturalists of a century ago. They confidently attribute to the inventors of the bow and arrow a state of mind similar to their own. They are so completely devoid of imagination that they cannot conceive any one acting otherwise than they would act in like circumstances. The fact that practices quite inconsistent with the ideas of the twentieth century, human sacrifice, for example, are among the most widespread and persistent features of human culture, does not disturb

them; such tiresome facts can be labelled 'religion' and consigned to another department.

Yet it should be obvious that those who instituted the practice of human sacrifice as a means of ensuring the welfare of the community in general, and the fertility of the earth in particular, must have had a mentality which differed widely from that of the modern scientist. We have, in fact, good reason to believe that among the Ancient Babylonians and Egyptians, as to a great extent among the modern Hindus, ritual was regarded as the prime motive power in the world. It was only by means of ritual that the sun was induced to rise and the rain to fall; that birth was caused, disease cured and death averted; in short, it was believed that ritual is productive of all good, and destructive of all evil. This belief, in various forms, is still found all over the world. There is, however, no reason to believe that it is in any way natural or instinctive; the probability is, that like all forms of culture, it was diffused from some one area, probably in South-western Asia. For belief in ritual, whether we call it magical or religious, depends on belief in the priest, the man who knows and performs the ritual, and it can hardly be doubted that the priest is a product of culture. And he may well have been the father of civilization. For in communities dominated by ritual, as we have reason to believe that the communities in which civilization originated were, the priest was the repository of all knowledge. There must, of course, have been knowledge other than of ritual, but all knowledge was dependent on ritual. The priestly colleges were centres of wealth and leisure, the only ones that there were, and therefore the only places in which experiments could be performed. But since ritual was the main interest of the priests, their experiments would be based upon the requirements of ritual, which, as it developed, would stimulate fresh experiments.

Our ritual has been stereotyped for so long that all

connexion between it and invention has been lost, but the last important innovation in ritual, the Corpus Christi festival, led to a whole galaxy of new devices in architecture and art.

As long as ritual is expanding and developing, so long can the inventor find shelter under its wing; but ritual expansion has seldom occurred. We have reason to believe that the vast ritual complex associated with the divine kingship was developed in the Ancient East, in the same regions as, and most probably in association with, the various inventions and discoveries connected with the growing of corn, the domestication of sheep and cattle, pottery and the use of metals, which we have discussed in previous chapters.

From the Ancient East the stream flowed east and west. The introduction of Buddhism to China followed upon that of earlier cults, and led to a period of ritual development lasting well over a thousand years. During this period many inventions were made, but when the ritual became stereotyped, invention ceased.

Westward the ritual stream flowed into Greece, but the development both of ritual and invention was more important in Asiatic than in European Greece.

The old Roman ritual gave little encouragement to inventiveness, and the later cults were imported ready-made from the East. As a result, the Romans invented almost nothing.

Much the same can be said of the Moslems. There was a period of mild inventiveness while the religion was settling down into its various sects, but since that process was completed, about 900 years ago, no Moslem has invented anything.

From the fall of the Roman Empire to the fifteenth century things were much the same throughout Europe; there were very few inventions, and these were mostly made by priests, or used in the service of the Church.

This connexion of ritual with inventiveness is not surprising. It might be supposed that inventions in connexion

with ritual occur merely as part of a general condition of inventiveness, but the evidence suggests that this is not so; inventions, as a general rule, are made only by persons of education and leisure, and in most ages these could only be priests. Further than that, in most ages and countries ritual is the chief interest of the people as a whole; in the religious festivals are combined their chief sources of pleasure and excitement in the present with all their hopes for prosperity in the future. The wish to embellish the ritual is the chief stimulus to invention.

In fact, however, there was, apart from some improvements in art and architecture, very little invention in Europe before the fifteenth century. In 1400 Europe knew little that had not been known in Babylon, Egypt, Greece, and Rome. But in the fifteenth century four very important events occurred almost simultaneously: the taking of Constantinople by the Turks and the consequent flooding of Western Europe with classical knowledge; the discovery of the New World, a world unknown to the Scriptures and the ancient sages; the development of block-printing, introduced from China; and the rise of Protestantism. The effect of the first three was to increase literacy and to stimulate curiosity and inventiveness; the effect of the last was to bring about the Reformation and the Counter-Reformation. Both of these claimed the Scriptures and the primitive Church as their sole guides, and thereby made all invention impious.

In earlier times there had, of course, been philosophers who were opposed to the theological beliefs of their day. In the sixteenth century, however, for the first time in the world's history, practical philosophy, that is science, found itself in opposition to religion. Many men had held impious beliefs, but the telescope was the first impious invention; it enabled people to see things which ought not to have been there. The first impious discovery had previously been made by Vesalius, who found within the human body organs which

ought not to have been there. Thus began the separation between science and tradition which is a feature of our civilization.

And it is a unique feature. In most ages and most countries there could be no conflict between science and tradition because there was no science. In the old civilizations all discoveries and inventions were incorporated in the tradition. If the steam-engine had been invented in Ancient Babylon, one of two things would have happened: either it would have been forgotten, as it was when invented by Heron of Alexandria, because there were technical or other obstacles to its use, or it would have been employed to work pumps. In the latter case there would have been instituted an annual steam-engine festival, and a chapter would have been added to the scriptures describing how the construction and use of the machine had been taught to man by the gods. Such procedure was impossible in modern Europe, and the telescope, steam-engine, and so on were developed as purely secular devices. It is this fact which has brought about the rapid expansion of modern science, an expansion which has lately become rapid enough to frighten scientists themselves.

To sum up—we see then that our Western civilization is not a product of evolution or any other natural process, but the result of a series of historical coincidences, and in particular the spread of new knowledge at a time of unprecedented religious reaction. Before the sixteenth century there was no science, and a slightly altered set of circumstances might have prevented its rise, and caused civilization in Western Europe to follow the same course as it did in India and China, that is to say, to reach a certain proficiency in literature, the arts and the crafts, and then gradually decay.

In fact, however, a unique civilization arose in Western Europe, one which by means of steam, electricity, anaesthetics, high explosives, and many other discoveries and inventions has transformed human life over the greater part of the

earth. All the evidence suggests that there was a comparable development in South-western Asia about the fourth millennium B.C., where were made a number of discoveries and inventions—corn-growing, cattle-breeding, metal-working, the wheel, the sail, the loom, the brick—which, when diffused, transformed the majority of mankind from wandering food-gatherers to settled food-producers.

The chief difference between these two great ebullitions of civilization is that while our modern ebullition is primarily secular, the ancient ebullition was primarily religious, being closely linked with the cult of the divine king. The rites and dogmas of this cult have been set out by Professor Hocart (in his *Kingship*, and his *Kings and Councillors*), and whether we find it in Peru, Fiji, Uganda, or Ancient Rome, it bears what seem quite unmistakable traces of a common origin. It is known to have been in existence in South-western Asia in the fourth millennium B.C., and may well have originated there, in association with the discoveries and inventions listed above. These may well have been made by the priests of the cult, who were probably the leaders of secular as well as of religious thought.

There have been other ebullitions of civilization, in Greece, in China, and elsewhere, but they were far less important than that of South-west Asia, from which they derived most of their elements.

Civilization, then, far from being a process that keeps going on everywhere, is really an event which has only happened twice. We can form an idea of why it happened the second time, but have really no data for an opinion as to how the first civilization arose. All we can say is that its founders must have possessed all that there then was of knowledge, but at the same time must have succeeded in preserving or freeing themselves from that subservience to the past which prevents all savages, and indeed the great majority of the human race, from originating anything.

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Abbreviation

J.R.A.I.—Journal of the Royal Anthropological Institute.

Corrigenda

Mr. Arthur Waley has been kind enough to read the proofs, and suggests the following amendments:

p. 63. The trade-route from Persia to China is not known for certain to be older than the second century B.C., and (p. 93) it is known that there were domesticated pigs in China before that date.

p. 163. The Chinese called Malaya 'Po-Se' on account of the Persian merchants who were settled there.

p. 167. Humboldt was mistaken in supposing that the Chinese and Tibetans had days named after the sea-monster and water. Even without these, however, the resemblances are sufficiently striking.

INDEX

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